THE Refrigeration Industry

INSTALLATION
MAINTENANCE
MERCHANDISING

AIR CONDITIONING
MACHINERY

MARCH, 1945

IN THIS ISSUE:

- How's Your Volumetric Efficiency?
- Change-over From F-12 to CH_3CL
- Bringing 'Em Back Alive!

Improved PACKLESS VALVES

"Simplicity" Packless Valves

...have round hand wheels for easy hand grip

...have flat steel springs for positive spring action

...have raised body seat that controls travel of stem

...have uniformly level connections for ease in installation

...have unusually low overall height, reducing required installation space

...have multiple diaphragms, a construction outlasting any other possible combination

Free

Write today or phone any branch office for our new, fully illustrated Refrigeration catalog.

Look Ahead with

Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND 8, OHIO
Plants: Cleveland, Columbia City, Ind., Los Angeles, Canada—St. Thomas, Ontario

This Weatherhead product is an outstanding example of the engineering "know-how" with which we have endowed all our refrigeration parts. The "Simplicity" Packless Valve was designed-in-use to insure economical long life and trouble-free operation. This product is available in a wide variety of sizes, both flared and solder types.

BRANCH OFFICES: NEW YORK • PHILADELPHIA • DETROIT • CHICAGO • ST. LOUIS • LOS ANGELES

It's the PAR EXTRAS *that make the* BIG DIFFERENCE

PAR BY *Lynch*

Compare the PAR Condensing Unit line and you will quickly see why Par enjoys such unusual popularity in the refrigeration field . . . note the Par *Extras* that make the big difference. These sturdy built, compact units have many outstanding features of construction that make for extra years of economical, efficient operation . . . streamlined in design and manufactured as complete condensing units, not an assembly of parts bolted together . . . and a complete range of models and sizes from 1/6 h.p. to 2 h.p. air-cooled units and 1 h.p. to 5 h.p. water-cooled units.

See these units at your PAR Jobber . . . ask for complete details on Par *Extras* or write for illustrated Par catalogue R-96 and supplement R-96A.

PAR—Condensing Unit Line sold exclusively through Franchised Refrigeration Supply Jobbers!

. . . . *By Comparison — You'll Buy PAR*

PAR Lynch DIVISION

Manufacturing Corporation, Defiance, Ohio U. S. A.

HERE'S REFRIGERATION without DEHYDRATION

The AMCOIL Food Conditioner

JOBBERS

QUICK PROFITS...

NOW... AND POSTWAR

Act Today

LICENSED UNDER
Extant Cobb Patents
Patent Pending

MODEL FC 50.....7500 BTU capacity at 15° T.D.
MODEL FC 80.....11300 BTU capacity at 15° T.D.
MODEL FC 160.....22600 BTU capacity at 15° T.D.

Here is the complete line of Amcoil Food Conditioners, each a complete unit. When combined with a condensing unit, each is a complete refrigeration system, designed for use in the preservation of commodities where dehydration is detrimental, yet cooling is essential. Available now to meet any size or space requirement, FC models are for use in walk-in boxes and panel-type RIF models are adapted for reach-in boxes and small walk-in coolers.

All are of the wall-hanging type and are completely automatic with a humidistat controlling the humidity at a predetermined level.

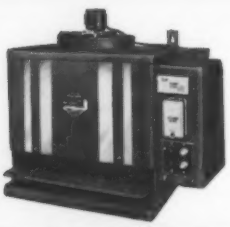
MODEL RIF 33.....4400 BTU capacity at 15° T.D.
MODEL RIF 43.....5500 BTU capacity at 15° T.D.

AMCOIL REACH-IN PANEL COOLING UNITS ALSO AVAILABLE NOW

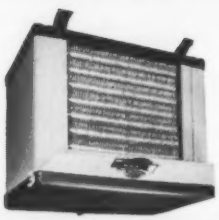
Similar in appearance to the Reach-In Panel Food Conditioner, Amcoil also has a complete line of Reach-In Panel Cooling Units. Designed for all utility refrigeration applications, they are available in various sizes — for under counter use, replacement in old style refrigerator cases, reach-in and small walk-in coolers. Provides cooling temperatures down to 36° F.

MODEL RI 25.....2250 BTU capacity at 15° T.D.
MODEL RI 30.....3000 BTU capacity at 15° T.D.
MODEL RI 40.....3250 BTU capacity at 15° T.D.
MODEL RI 43.....6150 BTU capacity at 15° T.D.

DEALERS stock this complete Amcoil Line. Immediate Shipment from your Jobber... or Direct from us



AMCOIL COMFORTAIRE CONDITIONER—A new development in air-conditioning, this completely automatic unit creates cool, dry, comfortable air at a fraction of the cost of re-heat systems. This is made possible by the use of the new and novel latent cooler patents.



AMCOIL ALSERVICE OPEN FACE COOLING UNIT. Is designed for efficient cooling and serves as a general utility unit in preserving foods and other commodities where a forced draft cooling unit is required. Streamlined design, in attractive grey and black color scheme, it can produce temperatures down to 34° F.

NEW

Now Ready For Delivery
A Panel Type Zero-Breeze
For Reach-In Coolers

Similar in appearance to The RIF-43 Food Conditioner

MODEL ZR 60
2750 BTU AT 10° T.D.

ZERO BREEZE LOW TEMP UNIT. A low temperature unit equipped with automatic electric defrost . . . wall-hanging model . . . produces temperatures from +20° F. to −20° F. . . . defrosts automatically on each off-cycle.

AMCOIL
AMERICAN COILS CO.
25-27 LEXINGTON STREET • NEWARK, 5 N. J.

Cable Address—**AMCOIL**

MANUFACTURER'S REPRESENTATIVES

J. J. Madden, 212 Madison Street, Dedham, Massachusetts • J. E. Oliphant & Co., 505 Uhler Bldg., Marion, Ohio • R. Barthelmess Sales Co., 1711 Chalen Ave., Jacksonville, Florida
F. M. Everaden & Associates, 220 S. 16th St., Philadelphia, Pennsylvania • P. J. Burrill, 800 N. Clark St., Chicago, Ill. • The Mac Silver Co, 547 S. Fairfax Ave., Los Angeles, California
Robbins-Greenwood Co., 3104 Main Street, Houston 4, Texas • Jordy Engineering Co., Inc., 813 Howard Avenue, New Orleans 13, Louisiana

SOME PEOPLE DON'T USE DETROIT VALVES!

Like the Eskimos for instance. Since nature provides their refrigeration, they don't care a good dried fish about Detroit Expansion Valves. They, like millions of others, have never even heard of them.

To thousands of refrigeration men, however, the name "Detroit" is nearly as familiar as their own. To these men, who *do* care about expansion valves, "Detroit" is synonymous with reliability and complete satisfaction. The widespread and enviable reputation of "Detroit" valves is attested by the fact that they have led the field for many years.

If you, unlike our Eskimo friends, are interested in outstanding expansion valve performance, specify "Detroit".

HERE ARE A FEW MEMBERS OF THE FAMOUS DETROIT LINE

No. 897 Dura-fram Thermostatic Expansion Valve for commercial applications. Compact and easy to install.

No. 899 New Dura-fram Thermostatic Expansion Valve for commercial installations. Furnished with external equalizer and forged union connection.

No. 788 Dura-fram large capacity Thermostatic Expansion Valve, with No. 790 Distributor, showing the distributor tubes and equalizer connection.

No. 673 Thermostatic Expansion Valve. For many years the standard of the refrigeration industry.

No. 793 Differential Temperature Expansion Valve specially designed for temperatures below *minus* 30° F.

DETROIT LUBRICATOR COMPANY

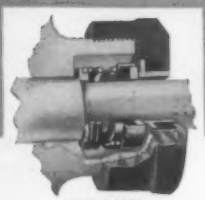
General Offices: **DETROIT 8, MICHIGAN**

Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • Radiator Valves and Balancing Fittings • Arco-Detroit Air and Vent Valves • "Detroit" Expansion Valves and Refrigeration Accessories • Air Filters • Stationary and Locomotive Lubricators.

ROTARY SEAL REPLACEMENT UNITS



UNIT 3280

STOCK LIST NO. 2 • THE ENTIRE LINE WILL BE FEATURED IN THREE SUCCESSIVE ADVERTISEMENTS OF WHICH THIS IS THE SECOND.

EVERY **ROTARY SEAL** REPLACEMENT UNIT HAS ITS OWN INSTRUCTION SHEET WITH AN ILLUSTRATION AND A DETAILED EXPLANATION OF THE INSTALLATION PROCEDURE . . .

Make of Compressor	Shaft Size	Stock No.	List Price
FRIGIDAIRE	9/16"	2100	$2.90
Seal space 1/4". 4 Bolt Holes. Diam. Bolt Hole Circle 2-1/16". **Models:** E, EAE, EE, EEF, EF, EFE, EW, EWO, F, FE, FEF, FS, TS.			
FRIGIDAIRE	9/16"	2102	2.90
Seal space 7/16". 4 Bolt Holes. Diam. Bolt Hole Circle 2-1/16". **Models:** LS, T, T-1, TL, TLS, T-S.			
FRIGIDAIRE	5/8"	1115	1.90
6 Bolt Holes. Diam. Bolt Hole Circle 2-3/8". 4 Bolts. Diam. Bolt Hole Circle 2-3/8". **Models:** A, A116, A120, A120L, A123E, A125, A125E, A125L, A125P, A223, A233E, A250, A375, AA120, AB133, AW, B, BK, BP, FA125E, FA125P, FA275, FA3100, FAAS120, FABS133, FAS125, FAS233, FAS233E, FW250, FW375, FWS233, FIB, FIBE, FIRP, FIC, FICC, FICE, G, H163, H164, H165, H203, H204, H205, H253, H254, H255, H333, H334, H335, K, L, N, O, P, S, SAE, SAU, SC, SS, TS, W116, W120, W125, W233, W250, W350, W375, Y, 1A, 1AA, 1AW, 1B, 1BE, 1BP, 1BW, 1C, 1CC. All 1933 Models No. 250, 275, 350, 375. Square Plate, Model 6R.			
FRIGIDAIRE	15/16"	3110	3.70
6 Bolt Holes. Diam. Bolt Hole Circle 2-3/4". **Models:** A4100, A4150, A5100, A5150, A6200, A6300, C, CO, D, FA4150, FW2D, FW3E, FW4F, FW5G, FW60, FW6H, FW6J, FW4100, FW6100, FW6200S, FW6300, F2CE, F2D, F3E, F4F, F5G, F80, R, WHF, W2C, W2D, W3D, W4E, W5F, W5G, W6G, W60, W475, W4100, W4150, W5100, W5150, W6150, W6200, W6300, U, 2C, 2CE, 3D, 4E, 5F, 6G, 60.			
GENERAL ELECTRIC	5/8"	2190	2.90
6 Bolt Holes. Diam. Bolt Hole Circle 2-3/8". Replaces General Electric Seal No. 137. **Models:** CB, CD, KF12, KF15, CB-2C-12, CB2-C-16, CB2-C-19, Rotary Compressors.			
GENERAL ELECTRIC & HOTPOINT	21/32"	1193	1.90
6 Bolt Holes. Diam. Bolt Hole Circle 2-3/8". Models for Reciprocating and Rotary Compressors. CB-1A-16, CB-1B-16, C-16A-134, CD-1A-16, CD-2A-16, CM3, CM32-A-16, CM34-A-16, CM304.			
GENERAL ELECTRIC	11/16"	3195	3.70
6 Bolt Holes. Diam. Bolt Hole Circle 2-7/8". **Models:** CM4, CM-45A-26, CM-4020.			
GENERAL ELECTRIC	13/16"	4198	4.50
6 Bolt Holes. Diam. Bolt Hole Circle 2-7/8". **Models:** CM5, CM53R.			
GENERAL ELECTRIC	15/16"	5197	5.90
6 Bolt Holes. Diam. Bolt Hole Circle 2-7/8". **Models:** CM6, CM62, CM63R, CM8, CM8W-6, 3 H.P.			
GENERAL ELECTRIC	2"	17199	17.90
8 Bolts. Diam. Bolt Hole Circle 5". **Models:** CM102L218.			
GENERAL ELECTRIC	2"	30199	30.00
10 Bolt Holes. Diameter Bolt Circle 5-1/4". **Models:** CM123J, CM124J.			
GRUNOW	3/4"	6385	6.80
HALSEY TAYLOR	5/8"	3130	3.70
5 Bolt Holes. Diam. Bolt Hole Circle 2-9/16".			
HALSEY TAYLOR	5/8"	3132	3.70
6 Bolt Holes. Diam. Bolt Hole Circle 1-3/4".			
HAYES	11/16"	3173	3.70
3 Bolt Holes. Diam. Bolt Hole Circle 1-11/16".			
HOTPOINT	21/32"	1193	1.90
Same as General Electric Unit No. 1193.			
ICEBERG	11/16"	2171	2.90
For compressors having threaded cap with 1-3/4" inside diameter.			
ICE-O-MATIC	5/8"	3347	3.70
4 Bolt Holes. Diam. Bolt Hole Circle 1-7/8".			
ICE-O-MATIC	5/8"	3340	3.70
6 Bolt Holes. Diam. Bolt Hole Circle 2-1/2". **Models:** A.			
ICE-O-MATIC	5/8"	3342	3.70
4 Bolt Holes. Diam. Bolt Hole Circle 2-5/8". Replaces bellows seal.			
ICE-O-MATIC	7/8"	8345	8.80
8 Bolt Holes. Diam. Bolt Hole Circle 3-3/8". **Models:** C, D.			
JOMOCO	5/8"	1115	1.90
6 Bolt Holes. Diam. Bolt Hole Circle 2-3/4". **Models:** RC5, RC6.			
KELLOGG	5/8"	2390	2.90
For compressors using threaded cap. **Models:** 46, 47.			
KELVINATOR	7/8"	4120	4.50
4 Bolt Holes. Diam. Bolt Hole Circle 3-1/4". **Models:** B, BB, K, LB, R, RB, RD, RM, R30, WB, WRB, WR20, WR40, WR41, WRM240. For Canada: F1935-R. All commercial ½ H.P. and up. 1-½ H.P. truck units.			
KELVINATOR	5/8"	1115	$1.90
6 Bolt Holes. Diam. Bolt Hole Circle 2-3/8". **Models:** A, AA, AB, B, C, CA, CB, CL, D, E, F, G, H, J, L, M, R10, R11, S. All Ice Cream Units, CA150, CA230, CA530, CA532, CA550, CB150, FB120, FB121, FB130, WFB131, FB140, FB141, WFB150, WFB151, WFB230, WBF250, WF150H, FB240, FB510, FB511, FB512, FB520A, CB220, CB230, CB510, CB531, CB532, CB551, WCB250, CB550, B125H, CB160, CB240, CB533, FB120, FB121, WFB130, WFB131, FB140, FB141, WFB150, WFB151, FB220, WFB230, FB240, WFB250, FB510, FB511, FB512, FB520A, F150H, WF150H, WG350H, WG450H, WG550H, WG650H, G350H, G450H, G550H, G9133A. Commercial 1/4 and 1/3 H.P. For Canada: AJ, B, C, CA, F, G, J, S.			
KELVINATOR	1-3/16"	14117	14.50
6 Bolt Holes. Diam. Bolt Hole Circle 4-3/8". **Models:** R, Y.			
KELVINATOR	1-3/8"	14119	14.50
6 Bolt Holes. Diam. Hole Circle 4-3/4". **Models:** T.			
KELVINATOR	1-1/2"	14122	14.50
6 Bolt Holes. Diam. Bolt Hole Circle 5-1/4". **Models:** U, V.			
KELVINATOR	1-9/16"	17123	17.00
6 Bolt Holes. Diam. Bolt Hole Circle 5-1/4".			
KING KOLD	5/8"	2135	2.90
4 Bolt Holes. Diam. Bolt Hole Circle 2-5/8". **Models:** All models including FL5, FL7, M4, M5, M6, MT7.			
LEONARD	5/8"	1115	1.90
6 Bolt Holes. Diam. Bolt Hole Circle 2-3/8". All Models.			
LIBERTY-FISCHER	11/16"	4172	4.50
For compresser using threaded cap.			
MAJESTIC	5/8"	2175	2.90
6 Bolt Holes. Diam. Bolt Hole Circle 3-1/16". **Models:** All standard units including 50, 51, 60, 61, 450.			
MAYFLOWER	.640"	2325	2.90
Single cylinder compressor using threaded cap. **Models:** 65, 70, 71, 75, 110, 150, 75L.			
MAYFLOWER	21/32"	2327	2.90
Twin cylinder compressor using threaded cap. **Models:** 50, 140, 142, 350.			
MAYFLOWER	3/4"	3329	3.70
For compressors using threaded cap. **Models:** 200, 500, 4100, 5100, 5200, 5300.			
MERCHANT and EVANS	9/16"	2336	2.90
4 Bolt Holes. Diam. Bolt Hole Circle 2-1/16". Replaces diaphragm type seal.			
MILLS	5/8"	4136	4.50
Seal operates on a 7/8" diameter sleeve. 6 Bolt Holes. Diam. Bolt Hole Circle 3-1/2". **Models:** C0401, 1/3, 1/4, H.P.			
MILLS	¾"	4138	4.50
6 Bolt Holes. Diameter Bolt Hole Circle 3-1/2". **Models:** Replaces sleeve type seal. For compressors beginning 1939. MB1AM, MB2AM, Body Nos. 1, 6A.			
MILLS	7/8"	9137	9.40
Seal operates on a 1-3/16" diameter sleeve. 8 Bolt Holes. Diam. Bolt Hole Circle 3-7/8". **Models:** ME, MF.			
MILLS	13/16"	9139	9.40
Seal operates on a 1-3/16" sleeve, 8 Bolts. Diam. Bolt Hole Circle 3-7/8". **Models:** MF3W, 1-1/2 H.P., 2 H.P.			
MOHAWK	11/16"	3280	3.70
For all compressors using threaded cap.			
MONTGOMERY WARD	11/16"	3280	3.70
For Universal Cooler Compressors using Threaded Cap.			
MONTGOMERY WARD	5/8"	1115	1.90
4 Bolts. Diam. Bolt Hole Circle 2-3/8"—Square Plate. **Models:** Frigidaire Compressor-6R.			
NORGE	5/8"	3210	3.70
Slotted shaft. 5 Bolt Holes. Diam. Bolt Hole Circle 2-7/16".			

ROTARY SEAL COMPANY

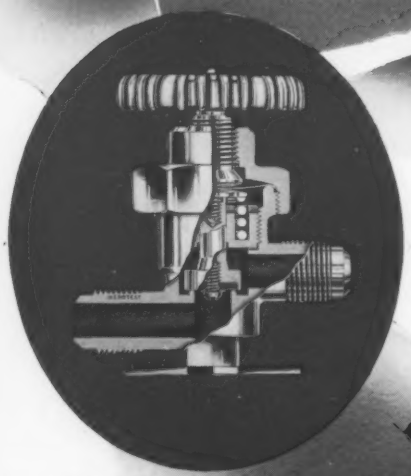
2020 North Larrabee St. **Chicago 14, Ill.**

CONCRETE REFRIGERATED SHIPS...

Another development where

KEROTEST

Advanced Precision Engineering will play an important role



Recently launched—a concrete refrigerated ship, 265 feet long—designed to carry enormous quantities of ice cream, perishable and frozen foods, plus 20 tons of ice daily—for use as a front line mobile refrigerator following our South Pacific invasions.

In peacetime, this development will prove invaluable for safe, low cost, world-wide transportation of perishable foodstuffs,—just one of the many new important developments in Air Conditioning and Refrigeration where Kerotest Valves and Fittings will play an important part.

KEROTEST MANUFACTURING COMPANY
Pittsburgh, Pa.

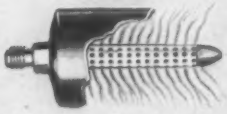
Send your Specifications for quotations.

KEROTEST

Valves... Accessories... Fittings...

ORIGINATORS OF "THE PATENTED DIAPHRAGM" PACKLESS VALVE

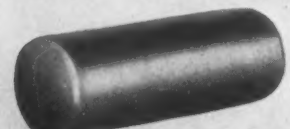
Cross section of Type 743 Henry Dehydrator.



Greater Efficiency Because of Patented Dispersion Tube. Entire volume of the dehydrant is exposed to penetration by refrigerant.

Strainer Tube Can Be Easily Cleaned or Replaced. The reinforced monel strainer tube is silver soldered to the outlet fitting eliminating bypassing of the refrigerant.

Abso-Dry Pressure Sealing Process. Loosening of seal cap prior to installation produces hissing sound due to escape of dehydrated air indicating that dehydrant is absolutely dry.



One Piece Drawn Brass Shell. Type 743 Dehydrators in the 6" length are drawn in dies so that they have only one joint—larger sizes have soldered end caps at both ends.

Easy to clean! Easy to restore to original efficiency by merely replacing the dehydrant! These are your first reactions when you remember field problems encountered in servicing Refrigeration and Air Conditioning installations. Apart from the refillable feature, however, Type 743 Henry Dehydrator should be the choice of anyone interested in more efficient removal of moisture in a system. This is because many of the standard Henry features of design and construction that have made Henry Dehydrators the choice of the Industry are incorporated in this refillable dehydrator. You will find these features described in detail on the left.

Type 743 Refillable Dehydrator is available in a series of sizes and capacities that will take care of the majority of commercial installations. Best of all, the unit is so reasonably priced that it will pay any service or contracting organization to use it as standard equipment.

Export Department
13 E. 40th St.
New York, N. Y.
Cables: ARLAB

HENRY VALVE CO.
TRADE MARK

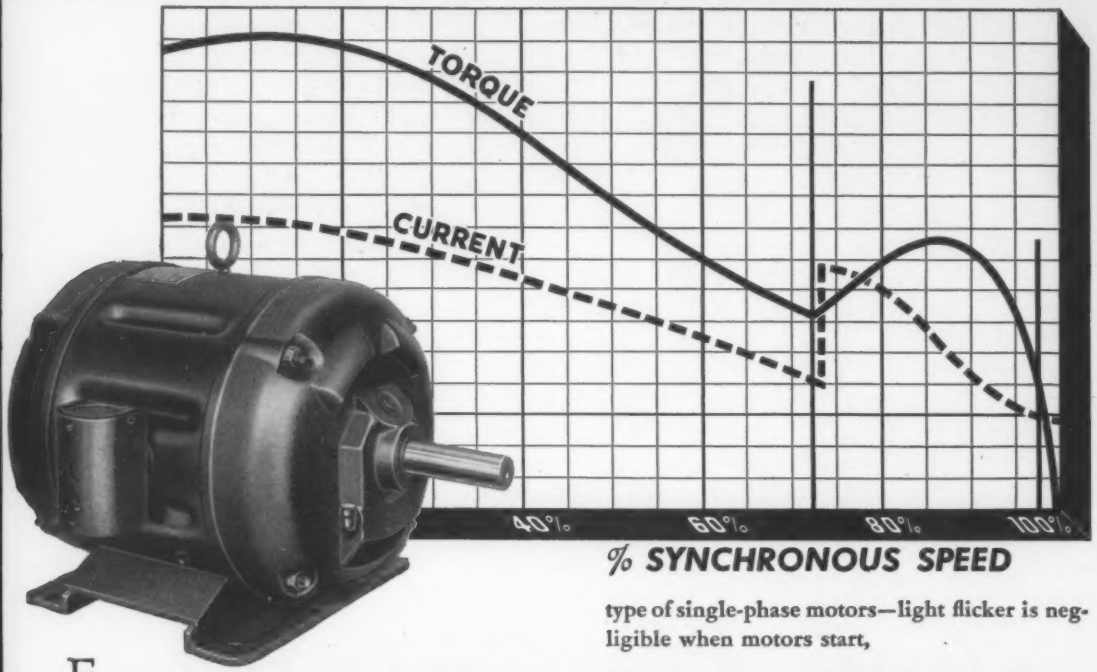
HENRY VALVE CO.

3260 WEST GRAND AVENUE, CHICAGO 51, ILLINOIS

PACKLESS AND PACKED VALVES • STRAINERS • DRYERS FOR REFRIGERATION AND AIR CONDITIONING
AMMONIA VALVES • FORGED STEEL VALVES AND FITTINGS FOR OIL, STEAM AND OTHER FLUIDS

APPROVED FOR NAVY, MARITIME COMMISSION AND ARMY USE.

For Those Hard-to-start Jobs—
Use Wagner
Repulsion-Start Induction Motors



For almost 50 years, we have been building repulsion-start induction motors, and today the majority of fractional-horsepower motors we make are still of the same type.

Notwithstanding the development of other types of single-phase motors during all those years, the repulsion-start induction type is still the preferred motor for compressors, pumps, stokers, and other machinery involving heavy starting-loads—because repulsion-start induction motors

1. start high-inertia loads and accelerate them smoothly,

2. have lower starting-current than any other type of single-phase motors—light flicker is negligible when motors start,

3. have high operating speeds even under considerable overloads, and

4. have a flat efficiency curve over a wide operating range.

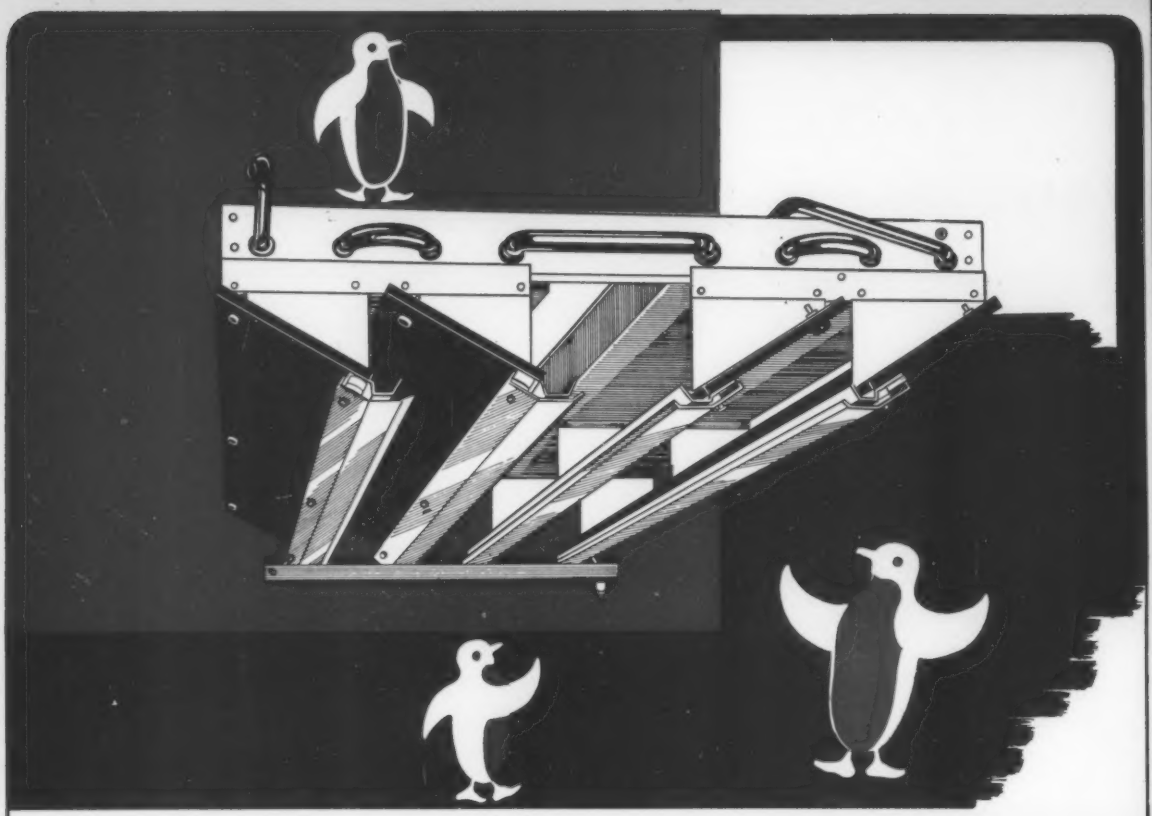
For complete description of Wagner repulsion-start induction motors, ask for Bulletin MU-183 or write the nearest of our 29 branch offices, at Atlanta 3, Baltimore 18, Boston 15, Buffalo 8, Chicago 16, Cincinnati 10, Cleveland 15, Dallas 1, Denver 2, Detroit 2, Houston 2, Indianapolis 4, Kansas City 8, Los Angeles 15, Memphis 3, Milwaukee 2, Minneapolis 4, New York 7, Omaha 2, Philadelphia 8, Pittsburgh 13, Portland 9, St. Louis 3, Salt Lake City 1, San Francisco 3, Seattle 4, Syracuse 2, Tulsa 3, and Washington 5.

MOTORS are but one of several WAGNER PRODUCTS serving industry.

Other WAGNER PRODUCTS:
AIR BRAKES
BRAKE LINING
HYDRAULIC BRAKES
INDUSTRIAL BRAKES
INDUSTRIAL BRAKE CONTROLS
TACHOGRAPH (Recording Speedometer)
TRANSFORMERS

MA5-3

Wagner Electric Corporation
ESTABLISHED 1891
6442 Plymouth Avenue, St. Louis 14, Mo., U. S. A.
ELECTRICAL AND AUTOMOTIVE PRODUCTS



Bush Plasti-Cooler

Now Available — Faster Deliveries

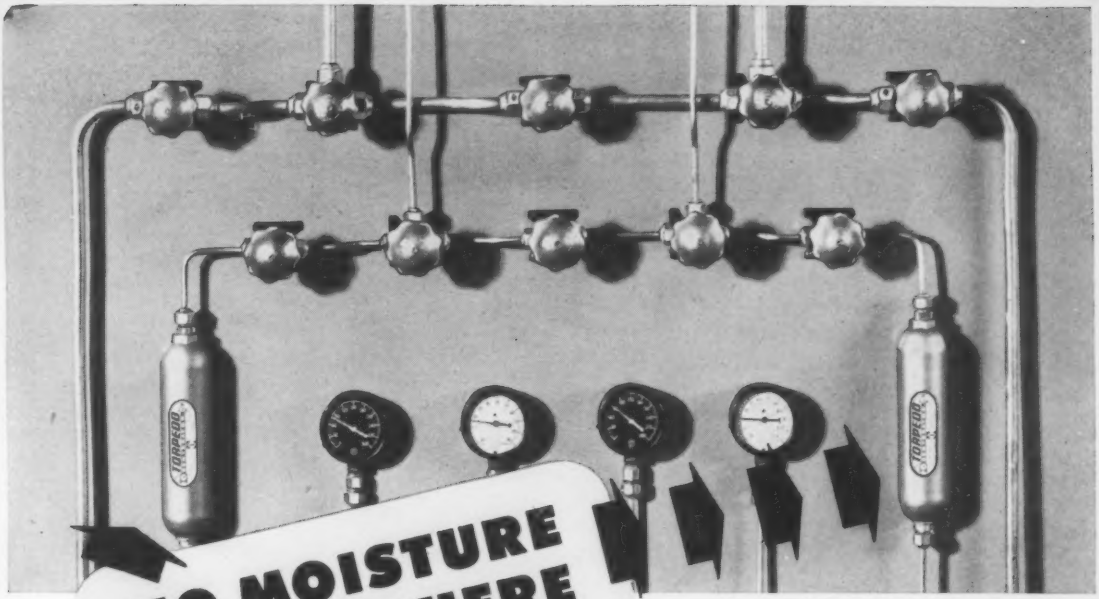
A noteworthy contribution by BUSH to the refrigeration industry, the BUSH PLASTI-COOLER combines the efficiency of the famed Bush Finned Coil with the proved advantages of sturdy plastics . . . the original application of plastics to the low side field. Coil features aluminum fins spaced 1/3" — ½" — ¾" and copper tubing (⅝" to 100 lin. feet — ¾" over 100 lin. feet). Baffles of gleaming, jet-black plastics eliminate all sweating . . . enhance appearance. Scientifically calculated pitching insures maximum cold air discharge. A choice of widths is available for different box sizes. The BUSH PLASTI-COOLER is the most modern evaporator at any price. For advanced engineering . . . BUY BUSH.

BUSH

Heat Transfer Products by

HARTFORD, CONNECTICUT

415 LEXINGTON AVENUE, NEW YORK ★ 549 W. WASHINGTON BOULEVARD, CHICAGO
EXPORT ADDRESS: 13 EAST 40TH STREET, NEW YORK ★ CABLE "ARLAB"



NO MOISTURE GETS BY HERE

Unique multiple installation uses Imperial Torpedo Dehydrators

IMPERIAL TORPEDO DEHYDRATOR

Your best weapon in the war on moisture

- **One piece streamlined shell.**
- **Fewer joints—no soft solder—less chance of leakage.**
- **Copper and brass construction.**
- **Packed with "Silica Gel".**

PROBLEM: The operator wanted a multiple refrigeration system that would give him the utmost efficiency at all times and would safeguard him in the event a condensing unit failed to operate.

SOLUTION: The unique multiple installation shown above, utilizing a by-pass and two compressors, was the answer. In this system, should one of the condensing units fail, both coolers can be run temporarily with the other unit.

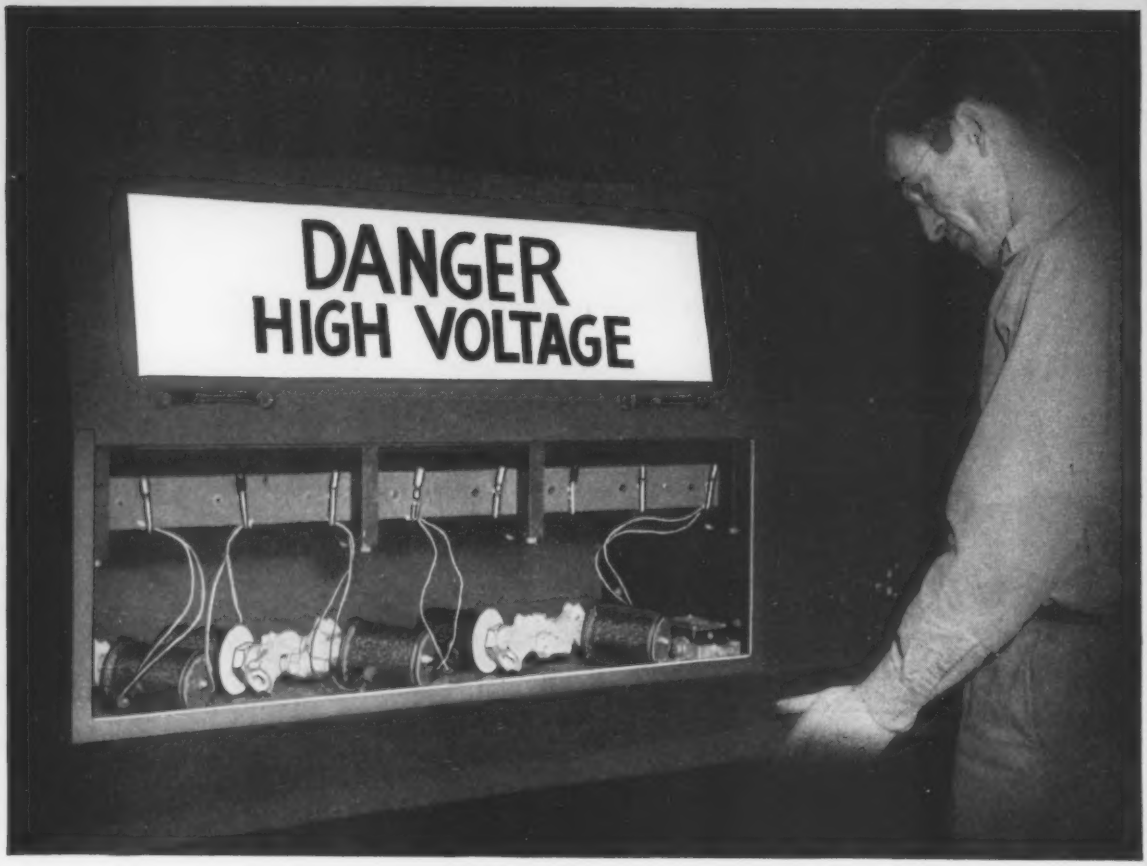
Two Imperial Torpedo Dehydrators, one on each high-side line, were installed in the system to safeguard against moisture in the refrigerant and to provide further assurance of trouble-free operation.

Imperial Fittings and Valves add to the overall dependability.

THE IMPERIAL BRASS MANUFACTURING COMPANY, 536 S. Racine Ave., Chicago 7, Ill.

IMPERIAL

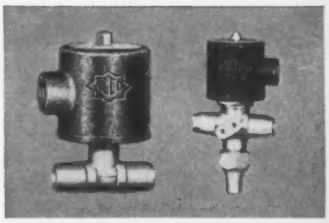
FITTINGS • VALVES • DEHYDRATORS • FILTERS • FLOATS • CHARGING LINES
TOOLS FOR CUTTING, FLARING, BENDING, COILING, PINCH-OFF AND SWEDGING



. . . and we mean HIGH voltage

This is where Alco Solenoid Valves win their "spurs." In this specially designed electrical test circuit, valves from our regular production are subjected to an overload of more than a thousand volts. To meet Alco's own rigid standards, each Solenoid Valve must hold this voltage without breakdown for 30 seconds.

Alco Solenoid Valves are available in a wide range of sizes for positive, dependable flow control of any refrigerant, including ammonia; water, brine, air, steam, etc. They can be installed in any location and operated by any control means. They are ideal for flow control on two-temperature systems. See your Alco jobber, Alco Valve Company, 843 Kingsland, St. Louis 5, Missouri.



Alco Solenoid Valves Type S-1 (left) and S-2 (right). These valves are quiet in operation, waterproof and free from residual magnetism difficulties. All internal working parts of stainless materials. Will not rust or corrode. Available as shown or with standard pipe thread connections.

ALCO VALVE COMPANY

Designers and manufacturers of Thermostatic Expansion Valves; Pressure Regulating Valves; Solenoid Valves; Float Switches; Float Valves.

843 Kingsland Avenue • St. Louis 5, Mo.

Can you afford to differ with the experts?

U. S. GAUGES STANDARD ON OVER 60% OF ORIGINAL EQUIPMENT

Look around your plant—check for yourself the number of pieces of equipment on which you'll find U. S. Gauges as standard.

The men who designed and built that equipment had pride in their product . . . they combed the gauge field—they weighed carefully the plus qualities of each make—they finally decided on U. S. Gauges for dependability and accuracy.

Next time you need pressure or vacuum gauges take advantage of the considered judgment of the original equipment manufacturer—replace with U. S. Gauges—the choice of the experts more than 6 out of 10 times.

UNITED STATES GAUGE COMPANY, SELLERSVILLE, PA.

ASK YOUR SUPPLY HOUSE

There's little reason to accept other makes—U. S. Gauges are undoubtedly stocked by your mill supply house—specify U. S. Gauges on your next order.

USG

UNITED STATES GAUGE

Manufacturers of Pressure, Temperature, Flow, Electrical and Level Measuring Instruments

REDUCE YOUR OPERATING COSTS WITH THE "LITTLE GIANT" PURGER

The "Little Giant" Purger is an essential item and a profitable investment that quickly pays for itself because:

It reduces power costs
It saves expensive refrigerant
It reduces wear and tear on equipment

When non-condensable gases are present in a refrigerant system, it will operate at higher pressures than it would if these gases were not present. Unnecessarily high pressures result in the compressor being subject to:

Higher bearing loads
Higher discharging temperatures
Increased wear on moving parts
Greater power consumption

It is particularly important that the refrigeration system be purged after a shut-down period of any considerable time. The usual practice is to pump the refrigerant back into the receiver and lock it in by means of valves. Repairs or alterations are made on the system during this time, and it is practically impossible to evacuate the system completely, with the result that the remaining air will cause excessive head pressures.

HERE ARE THE ADVANTAGES OF PURGING WITH THE "LITTLE GIANT" PURGER:

THERE IS NO GUESSING—There is positive indication when purging is necessary. The sight glass gives visible evidence of non-condensable gases in the system.

NO REFRIGERANT LOSS—The air in the system is completely separated from the refrigerant before the purge valve is opened.

SIMPLE TO OPERATE—All operating valves easily accessible. Not necesarry to check pressures or temperatures. No need to shut down the system.

POWER SAVINGS—Power savings, due to a reduction in head pressure will pay for the "Little Giant" many times over.

MANUAL OPERATION—Fully manually operated, there is no possibility of a slow leak developing which would cause a loss of refrigerant before cause is discovered.

Write us for full particulars and instructions for installation and operation

MUELLER BRASS CO.
PORT HURON, MICHIGAN

THE Refrigeration INDUSTRY

VOLUME 2, No. 3 MARCH, 1945

CONTENTS

THE COVER . . . A 2,600-pound electric refrigerator is moved into the post exchange headquarters of the South East Asia Command with the help of a group of GI's and a 35-year-old elephant. Karunavathi (the elephant) received a quarter stalk of bananas and a few slices of bread for his part in the job. (Signal Corps Photo)

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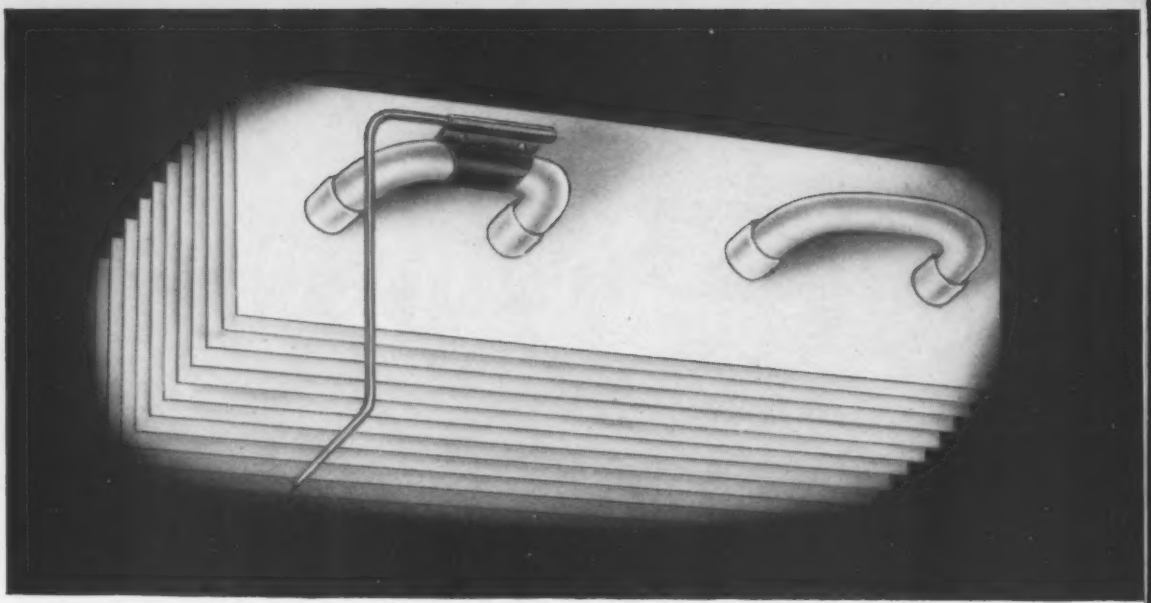
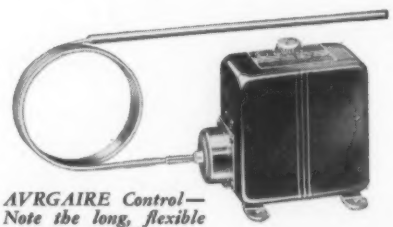


Proper Temperature Control—SAVES!

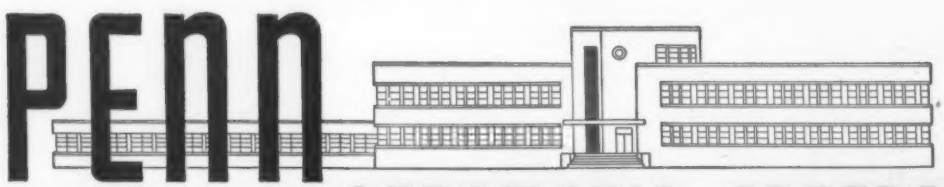
• Refrigeration protects critical food supplies against spoilage and waste . . . protects their quality. But the degree of this protection depends upon the efficiency of the automatic control.

That's why Penn developed AVRGAIRE. Designed for walk-in coolers, reach-in boxes and all "above-freezing" applications, AVRGAIRE incorporates a *single, new-type temperature bulb that* is applied in an *entirely new and different manner.* Look at the above picture . . . see how one end of the bulb is clamped on the refrigerating coil while the balance is brought down and under. Result? The bulb is influenced by the *average temperature* of both coil and air. Thus, AVRGAIRE holds box temperature within extremely close limits without irregular short-cycling of the compressor. It automatically defrosts on each operating cycle when box load is normal, BUT delays defrosting when box is loaded with warm produce and extra cooling capacity is required. And it maintains proper humidity to minimize dehydration and "sliming" losses.

But get the full story on AVRGAIRE, complete with pictures and diagrams. Write *Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th St., New York 16, U.S.A. In Canada: Powerlite Devices, Ltd., Toronto, Ont.



AVRGAIRE Control—Note the long, flexible temperature bulb.



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSOR

BTU's

News • Laws • Trends

MANPOWER

REFRIGERATION REPAIRMEN AND ENGINEERS, in the most recent War Manpower Commission listings, are classed as "essential" rather than "critical." This means that workers in these jobs will be considered for deferments if they are either in the 26-29 or over 29 age groups, with older men naturally having the better chances.

WMC officials appear to have the idea that the training program carried on since the war's beginning through the National Refrigeration Service Council has resulted in the recruitment of enough trained men to keep all necessary equipment in operation. What WMC forgets is that while approximately 10,000 were trained, losses during the war period to the draft and war plants were closer to 20,000—and that almost every new worker has to have an experienced man with him on jobs that pose any complications.

Strong representations as to the industry's manpower situation are being made to WMC heads by the Council, and it is hoped that these will result in an up-grading so far as the national picture is concerned.

It is true, however, that the WMC guide is not binding on local offices, and repairmen and engineers might be adjudged critical in some areas and only essential in others. So take into consideration the local situation in your area in making your deferment and employment plans.

L-38 AND 38-A

WORK ON AMENDMENT OF L-38 and the newly proposed L-38-a goes ahead, with likelihood that both may have been issued by the time this note appears.

Among other things, the order is expected to eliminate use of WPB-541 by dealers for inventory purposes. Use of WPB-547 would be continued temporarily, but applications filed on it would not be granted in other than exceptional cases, where supplies of particular items are available for dealer and distributor inventories. For example, it might be applied on orders for display cases made under the display case program.

This would mean that distributors and dealers would have to continue to extend customer ratings on major equipment to be sure of getting equipment to replace stocks. Early plans were that manufacturers would be forbidden to deliver condensing units or parts for them on blanket MRO ratings (except for emergency repair) assigned by CMP-5, 5A or 9A, P-126, when the amended L-38 issues.

L-38-a: This would govern deliveries and acceptance of deliveries of condensing units rated 5-hp. or less. Users of a stated number of these units in a given period may have to file an application for permission to receive delivery of them if they are going to be used in a product or delivered to a sub-contractor, or if they will be incorporated into a product for an ultimate user.

MOTORS

FRACTIONAL HORSEPOWER MOTOR production fell off in December. New orders in the month were less than shipments in everything except AC motors. Lack of backlog of orders for military requirements may hamper deliveries in the next few months, by delaying motor makers in making advance orders for components. As far as non-military uses are concerned, it is expected they will be held to the fourth quarter 1944 rate for future requirements.

In explaining controls over motor sales, WPB said that a certain number are allocated for civilian and commercial replacement. All orders (except those to farmers under PR-19 or for replacement of a damaged household motor exchanged and repaired for resale) must carry an AA-5 rating or better. Damaged motors, however, may be scrapped or turned in to a manufacturer for replacement or exchange without a rating.

Production of integral hp. motors during the next six to nine months will be as critical as any period in the last two years.

COILS

TO MEET THE SHORTAGE of aluminum sheet affecting the manufacture of coils for refrigeration equipment, WPB has asked coil producers to put off placing orders on sheet mills as long as possible. In this manner, it is expected that the burden which mills are now carrying will be greatly eased.

CMP-9A TIGHTENED

WPB HAS SHARPLY CURTAILED the amount and usage of copper wire by civilian repair shops under CMP-9A, in an amendment issued February 15. New limits are $75 worth of wire per quarter or 10 per cent of 1941 usage, whichever is larger. Former limits were $150 worth or one-eighth of 1941 use.

CMP-9, companion regulation that allowed retail stores to buy wire for resale, has been suspended through June 30. Retailers must cancel all outstanding copper wire orders carrying the V-3 symbol.

The amended CMP-9A also prohibits use of copper wire for certain kinds of work. For example:

No new connecting or attachment cord may be supplied for a refrigerator or other appliance where it is possible to patch up the old cord and make it do for the remainder of 1945; no CMP-9A wire may be used to make up an extension cord for resale.

ROUNDUP ON RULINGS

THE AMENDMENT TO ORDER M-28, governing the use of Freon-12, has been issued. It provides that F-12 may now be used for any refrigeration or air conditioning systems except those included in List A of the order

Continued on page 55

ABOUT OUR MANPOWER PROBLEM

Current draft setup rates refrigeration repair men on same basis as those fixing bicycles and toasters. Action is needed—NOW—to avert a situation which may prove dangerous to the public health

DESPITE the successful training since the war's beginning of almost 10,000 new men to replace the 20,000 lost to the draft and war plants, the refrigeration industry may be faced with an even more serious shortage when this summer's heavy servicing season arrives.

This is the result of confusion on the part of local draft boards as to the relative status of refrigeration repair men and engineers, in the wake of revised War Manpower Commission listings designed to assist local boards in classifying registrants for induction or deferment to meet the stepped-up Selective Service calls.

Skilled Men Threatened

WMC's most recent listing classifies refrigeration repair men and engineers in the "essential" or "locally needed" bracket, rather than as "critical." Faced with the necessity of furnishing more men for the armed services, draft boards in some communities, according to reports reaching the Administrative Office of the National Refrigeration Service Council, are ordering skilled refrigerator mechanics to leave their present employers and go to work in war plants or face induction.

In an effort to halt any further depletion of the industry's already scarce manpower supply through a misunderstanding of the situation which now exists in this field, W. R. Kromer, national director of the National Refrigeration Service Council, has asked local Councils to furnish national headquarters with specific data on the situation in their own communities, so that immediate action can be taken to bring the industry's case to the attention of the proper WMC officials.

"Classifying refrigeration mechanics as 'essential' rather than 'critical' leaves them in the same category as men repairing sewing machines, bicycles, toasters, and the like," Mr. Kromer declares. "These items are conveniences, while the maintenance of refrigeration equipment deals directly with the public health.

"The National Refrigeration Training Program has been very successful to date in that we have trained approximately 10,000 men to replace the 20,000 lost to the armed forces and other war work," Mr. Kromer points out. "This success, time and effort spent by both the members of the industry and the government agencies can be turned immediately into failure should more competent experienced refrigerator repair men be inducted into the armed services or forced into war plant work by local draft boards.

Trainees Need Guidance

"Each of these trainees must be guided by experienced men. It is necessary to accompany these men on a good share of the service calls they make during the first year and after. It is necessary that they be supervised and instructed in shop work. Approximately 25 per cent of calls made by these inexperienced men must be made over by an experienced man to correct mistakes. This percentage actually reduces the number of men replaced.

"Complicated commercial and industrial installations cannot be maintained and kept in operation by trainees. These installations include small and large food storage installations throughout the country, and small and large refrigeration installations used in war plants, that have contributed much towards the record American industries have made in war production. There are numerous other installations of refrigeration equipment necessary to the war effort with which the armed forces and officials in Washington are familiar, such as blood banks, hospital air conditioning, and the like."

Telegram to Hershey

In a telegram to Selective Service Director General Lewis B. Hershey, urging clarification to local boards of the industry's classification, the national director points out that the training program has replaced only one-half of the men previously lost, and that the industry is now operating with a minimum force if it is to keep food and war industry refrigeration equipment in proper operation.

"Further depletion of our ranks can seriously cripple the industry, as the remaining experienced and competent men are needed to guide our trainees and keep specific equipment in operation that will accept no substitute for experience," the telegram states.

"Do not cripple this industry just before our next refrigeration season, which will prove to be additionally difficult because of continued aging of equipment."

Carrying only an "essential" rating, refrigeration repair men do not qualify for automatic deferment, Mr. Kromer points out. This being the case, it is necessary to appeal the case of each man who is reclassified—first

Continued on page 37

FROM THE SERVICE MAN'S ANGLE

HERBERT FRAME, Public Service Co., Baltimore, Md., says . . .

Processed especially for the dehydration of refrigerants. Gives you—1–Maximum capacity that is not affected by oil; 2–Instant action; 3–Removal of Acids and Corrosive Compounds; 4–Freedom from Channelling of Refrigerant; 5–Safety . . . because it will not attack metals or alloys.

"DAVISON'S Silica Gel gives us something you can't overlook in this business — CUSTOMER SATISFACTION"

"Further," says Mr. Frame, "we've been in business long enough to have tried practically every drying agent on the market and none of them gives the combination of advantages that Davison's gives us. Removing moisture is one thing—but HOW a drying agent does it and what it does besides removing moisture are other things we must consider. And when you consider them all—there's only one answer—*USE DAVISON'S AND BE SURE!*"

Order Davison's Silica Gel from your jobber—in factory-charged dehydrators and for refilling

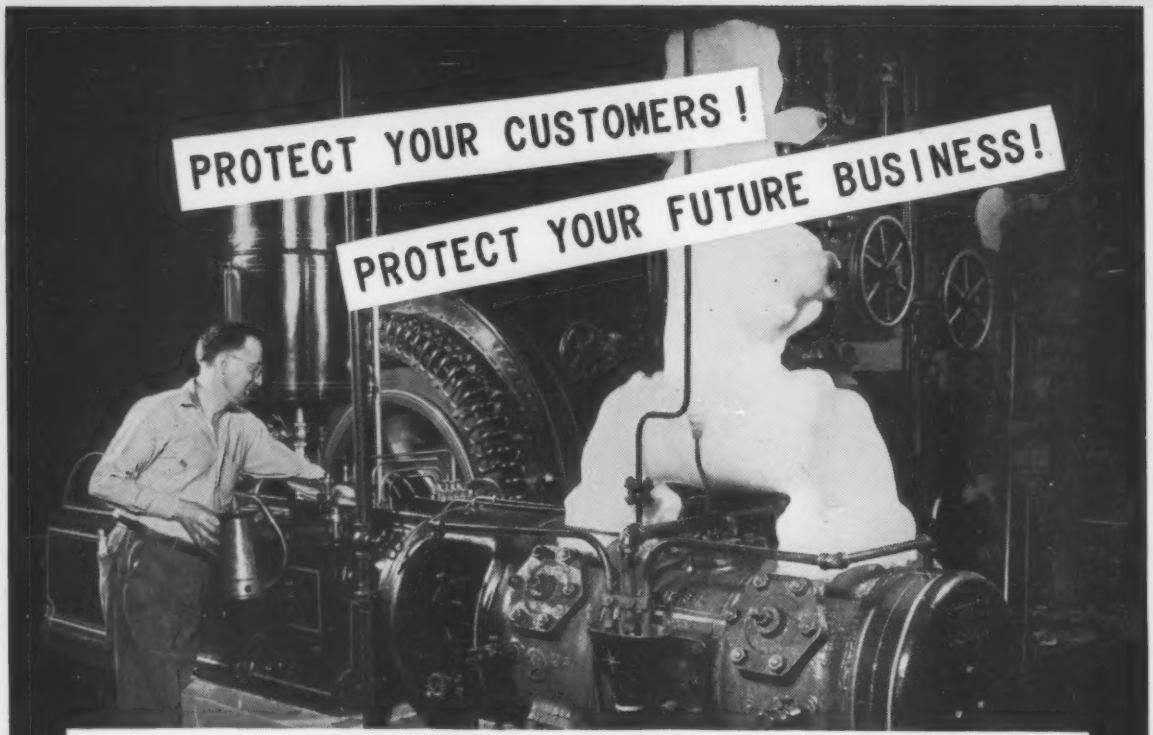
CURTIS BAY WORKS

THE DAVISON CHEMICAL CORPORATION

Progress through Chemistry

BALTIMORE-3, MD.

Canadian exclusive sales agents for DAVISON'S SILICA GEL: CANADIAN INDUSTRIES LIMITED, General Chemicals Division



SUN LUBRICANTS . . . Are Long-Lasting, Reliable

Especially Refined For Every Make, Size or Type of Refrigerating Equipment

Here is a case history of interest to every servicer and user of refrigerating equipment, large or small.

An internationally known cold storage and warehousing firm was bothered with ammonia losses from a big two-stage compressor, caused by gum and carbon formation on rod packing. Sludge formation in the crankcase was heavy.

Ammonia losses decreased greatly after they switched to Sun's Solnus oil. The split-type, rod packing, which had gummed up and caused the trouble, now stays clean. Rings, valves and crankcase are cleaner, over-all operation more efficient.

These concrete results are typical of the performance of Sun's specially prepared refrigerating oils for cold storage plants, lockers, commercial and domestic air-conditioning and refrigerating systems.

You can use these oils with perfect confidence that they will give your customers the maximum in protection. They resist oxidation and sludge formation, remain fluid at specified low temperatures, are unaffected by sulphur dioxide and other refrigerants.

Suniso oils were especially developed for refrigerating equipment and are available in a number of grades for every make, type or size of equipment. They are packaged in 1, 5 or 10 gallon containers, or 50 gallon drums. For further information about Suniso oils, or Sun greases and lubricants for engines, generators, motors, pumps and other industrial equipment, write direct to . . . .

SUN OIL COMPANY • ***Philadelphia 3, Pa.***

Sponsors of the Sunoco News Voice of the Air—Lowell Thomas

Send for "Air Conditioning and Refrigeration" Bulletin on valuable lubrication pointers.

SUNOCO **SUN INDUSTRIAL PRODUCTS**

OILS FOR AMERICAN INDUSTRY

HOW TO PLAN YOUR OWN STORE

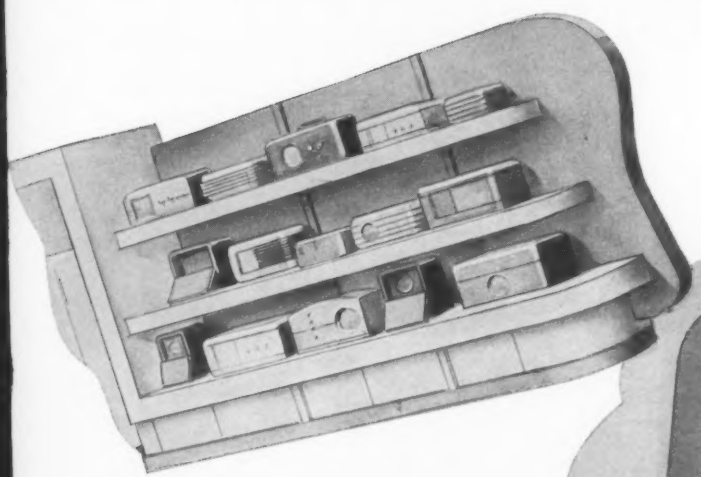
SUCCESSFUL dealers long have recognized showmanship as an essential part of their business. It is an accepted fact that the physical appearance of your store is of great importance not only in attracting customers, but in helping to sell them once they are inside the store.

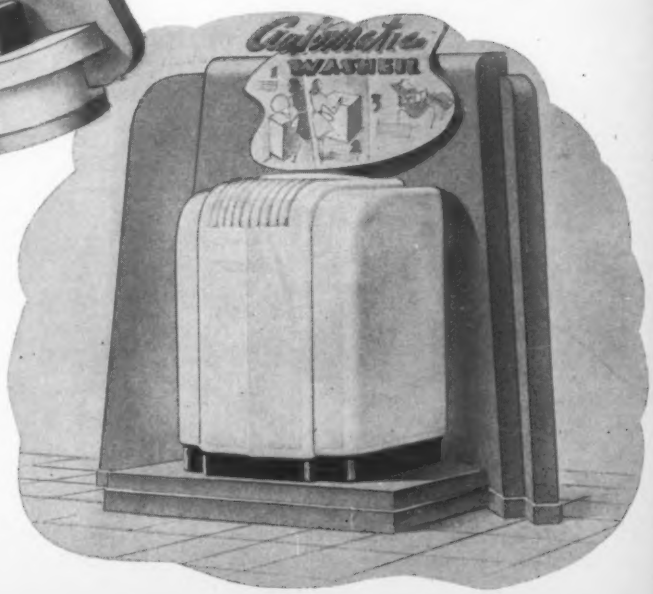
Modernizing pays dividends in the most direct way possible—in increased sales and greater store traffic. In many stores, modernizing acts as an aid in grading up sales; it enables some stores to attract customers not previously in the clientele; it acts to stimulate employes to greater efforts and boosts the morale generally.

Part 3

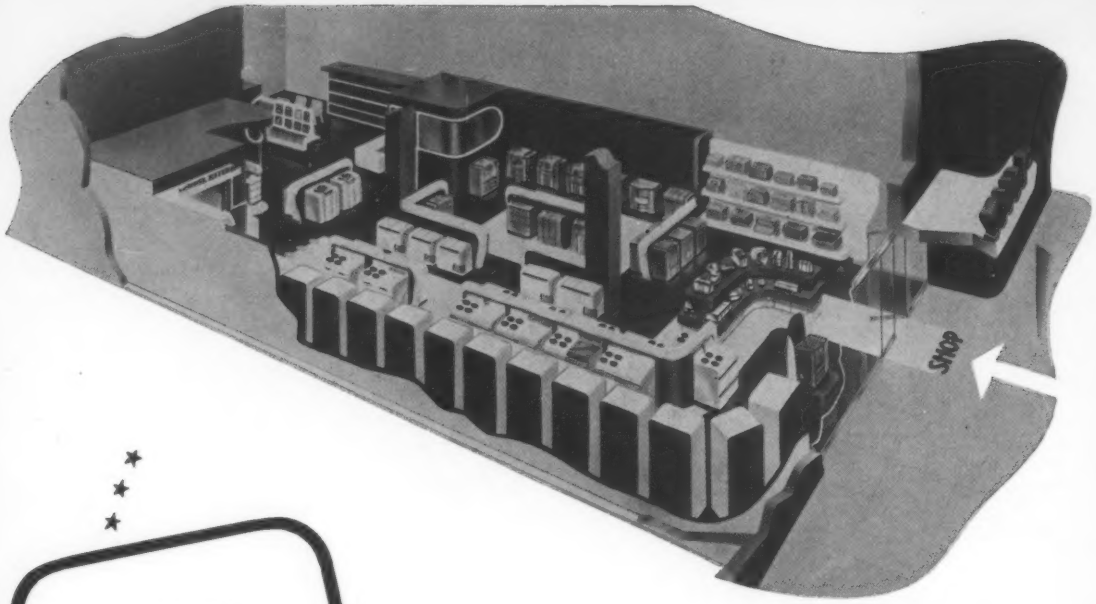
You are probably thinking now about how to remodel and modernize your store for postwar profits, to make it a center of your community and a modern background for your sales efforts. To help you do this, we are presenting here practical, easy-to-build store layouts and display fixtures.

A handsome book in color describing these fixtures and store arrangements in detail has been prepared by Admiral Corp., and through a special arrangement is available to REFRIGERATION INDUSTRY readers. If you haven't already done so, write the editor of The Refrigeration Industry, 812 Huron Road, Cleveland 15, today for your copy.





Display unit above is for radios or small appliances; special fixture (right) is for some featured product. For store layouts and fixture plans, see pages following.

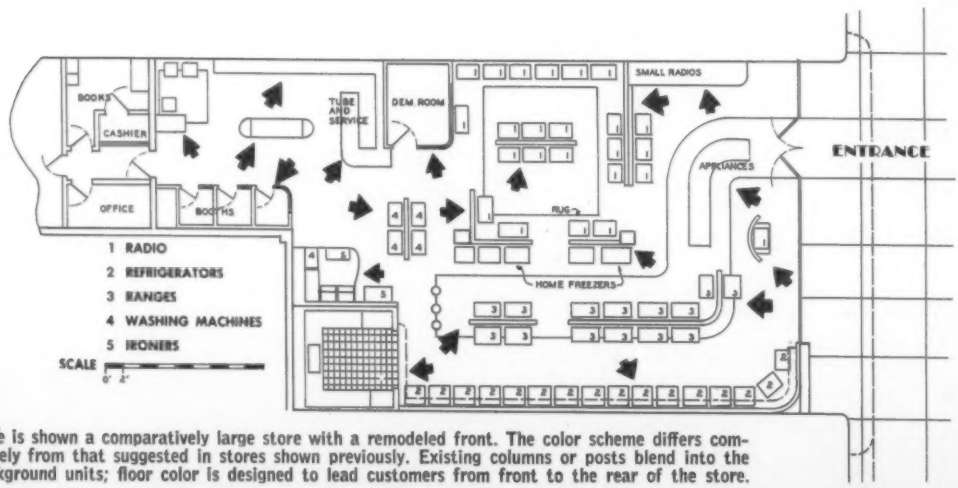


Store No. 3

BEFORE you decide to modernize, it will pay you well to give careful consideration to the most effective safeguards you can apply to your investment. No store can yield maximum returns if it is not so located as to take the greatest possible advantage of both present and future marketing possibilities.

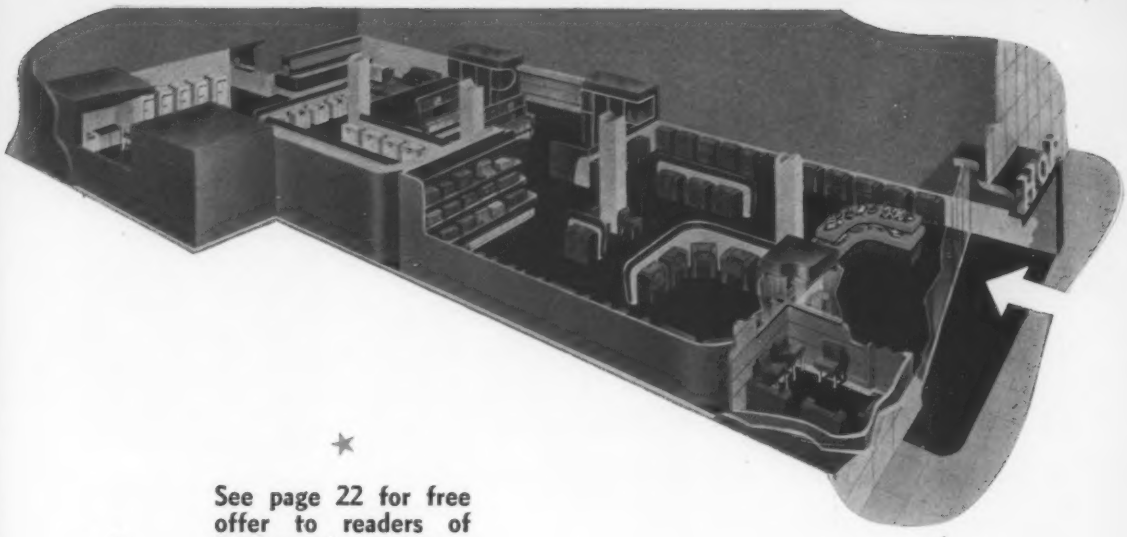
Because the war has shifted population, changed buying habits, and altered purchasing power, many a retail store that was in an excellent location before the war may find itself far away from the postwar's trade activities.

In considering the potential value of your retail location, it is well to establish the boundaries of your trading area, and study the changes that have taken place in it since the war.



Here is shown a comparatively large store with a remodeled front. The color scheme differs completely from that suggested in stores shown previously. Existing columns or posts blend into the background units; floor color is designed to lead customers from front to the rear of the store.

HOW TO PLAN YOUR OWN STORE PART III



See page 22 for free offer to readers of Refrigeration Industry.

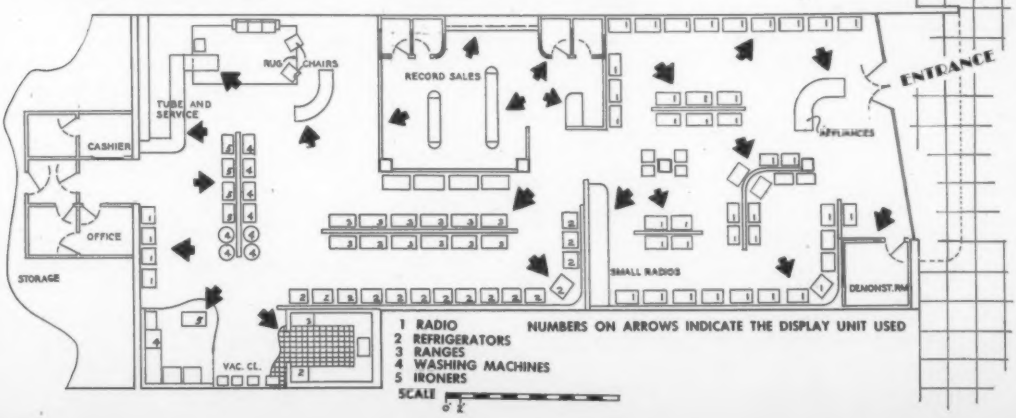
Store No. 4

PLANNING an electrical appliance layout is not merely a question of selecting adequate space and good location. Provisions must also be made for electric wiring, plumbing facilities, and basic display treatments when the plan is still in the blueprint stage.

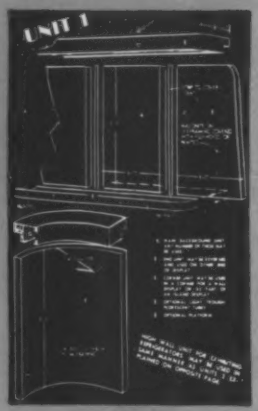
Purpose of any display is to combine various elements, such as color, lighting, elevation, and background, in a manner that will enhance the merchandise and make it more attractive to the customer. Displays must not only dramatize the product, but must be aimed at simplifying and improving the merchandise presentation.

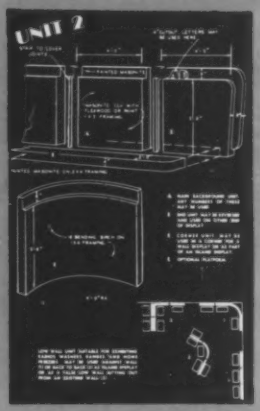
Whether the treatment be simple or ornate, use good basic display principles. Don't close your store while you're modernizing—let your customers in on the "secret".

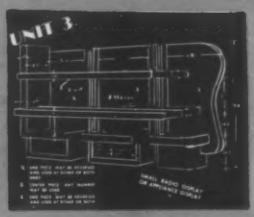
This is the largest of the four store layouts. All display units are utilized, several serving multiple purposes. Unit No. 2, for example, serves as both wall and "island" display, and as enclosure around record department.

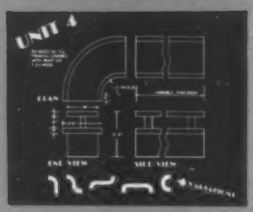


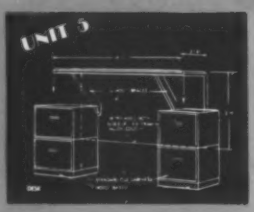
BASIC UNITS FOR USE IN POST-WAR STORES

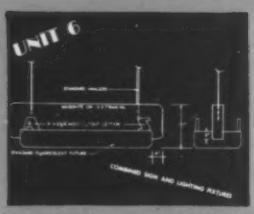


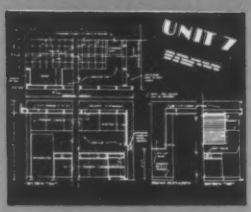


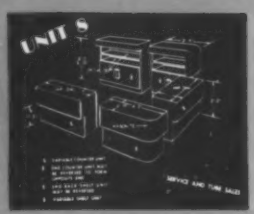


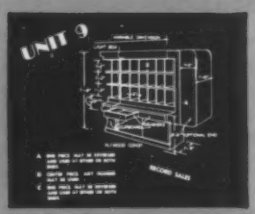


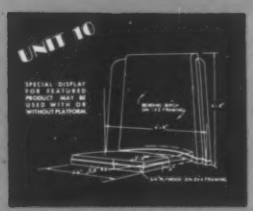


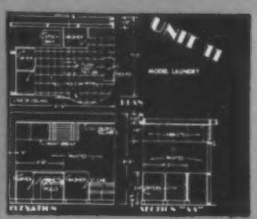


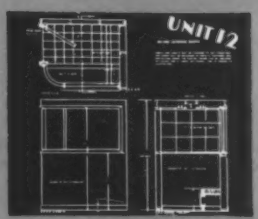


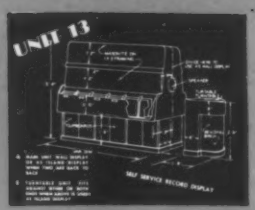


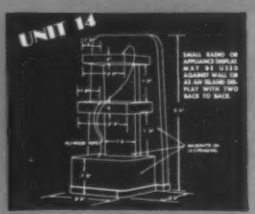












SHOWN on this page are 14 of the basic units presented in a portfolio by the Admiral Corp. Most units are display fixtures which can be quickly and easily constructed. Unit 1 is a straight or curved fixture for refrigerators; Unit 2, a lower fixture, can be used for home freezers, etc. Unit 3 is designed for display of small appliances, while Unit 4 is a more flexible scheme for similar use. Unit 5 is a desk, Unit 6 a combined departmental sign and lighting fixture. Unit 7 is a model kitchen; Unit 8 a counter for small part sales, Unit 9 is a record case. Unit 10 is an island fixture designed for display of a featured product. Unit 11 gives the layout for a model laundry, and Unit 12 the plan for a record-listening booth, while Unit 13 is a self-service record rack. Unit 14 is a tall fixture for display of small appliances.

Space limitations naturally prohibit larger reproduction of these plans. The Flex-o-Plan book, however, which gives complete details for the use, and large size working drawings for construction, of these units, is available free up on request.

Write to REFRIGERATION INDUSTRY, 812 Huron Road, Cleveland 15, Ohio, today for your copy.

Dario de la Garza, long identified with foreign advertising and sales promotion, has joined the Carrier International Division as advertising manager.

Former member of Colgate-Palmolive - Peet Co.'s foreign advertising department, Mr. de la Garza also served for eight years as foreign advertising and sales promotion manager of Servel, Inc. More recently he has been identified with the National Export Advertising Service of New York.

N. Stuart Irwin has been appointed assistant director of advertising and sales promotion for Carrier Corp. For the past six years Mr. Irwin has been with General Electric and Sherwin-Williams, engaged in advertising, promotion, and management-employee relations work.

Clarence E. Quigley has been named to handle special assignments in the appliance sales department of Frigidaire. An employee of General Motors Corp. since 1920, Mr. Quigley joined the Frigidaire division in 1926. He was first employed in the educational department and moved from there to the sales division in 1927. During his 17 years with Frigidaire he has been regional manager, water cooling manager, and assistant manager of commercial sales.

Charles R. Matthews has been named manager of the Northern California district of Westinghouse Electric Supply Co., headquartered in San Francisco.

Elmer A. Skowbo has been named manager of the Detroit office of the Dole Valve Co., manufacturer of brass specialties. He was assistant manager of that office six years ago, and since has been manager of the company's eastern offices.

C. W. Stoner has been appointed chief refrigeration engineer of the Ben-Hur Mfg. Co., maker of home and farm freezers. Connected for the past several years with the development of low temperature cabinets, Mr. Stoner's previous experience includes service with Sears in the testing and merchandise development laboratory, and with Union Ice & Cold Storage Co. of California.

James King has been appointed field sales engineer in the New York factory branch of General Controls Co. He will serve users of automatic controls throughout metropolitan New York.

Robert J. Quinn, of The Mathieson Alkali Works, was elected president of the Compressed Gas Manufacturers' Association, Inc., at the organization's 32nd annual meeting recently at the Waldorf-Astoria in New York City.

Appointment of **E. R. Gould, Jr.,** as export manager of Wincharger Corp., was announced by Mr. G. H. Calhoun, sales manager. Mr. Gould until recently was assistant export manager of Kelvinator export division, Nash-Kelvinator Corp.

As export manager, Mr. Gould will have charge of several lines of electrical equipment which includes Wincharger rural electric systems, radio towers, D. C. motors, dynamotors and a line of special Winco rotary electrical equipment.

Appointment of **J. J. Anderson** as eastern district supervisor of the refrigeration specialties department of Westinghouse Electric & Mfg. Co. has been announced by W. H. Loeber, eastern district manager of the electric appliance division. Mr. Anderson is located at the company's eastern district headquarters at 40 Wall St. in New York. Mr. Anderson has served as air conditioning supervisor in the central district and during the period from 1941 to 1944 has been in the war products department of the company.

James E. Power has been appointed eastern sales manager of the mechanical goods division of United States Rubber Co. Mr. Power began his career in 1906 as an office boy. Five years later he became a salesman, and in 1926 he was appointed manager of the New York branch of the mechanical goods division.

J. M. Tenney, formerly refrigeration sales manager of Norge, has been appointed western sales manager. **Earl R. Bridge,** formerly laundry equipment sales manager, has been named to the post left vacant by Mr. Tenney, and **R. H. Pizor,** who has been acting as key sales specialist, will succeed Mr. Bridge.

Edward F. Theis, who until 1942 was closely associated with the company's refrigerator division, has been elected vice president in charge of refrigerator production for Philco Corp. Since leaving Philco in 1942, Mr. Theis has been connected with Curtiss-Wright as manager of its Indianapolis propeller plant.

A. H. Lockrae has been named manager of heating controls division of Minneapolis-Honeywell.

Rodney F. Lauer, manager of the Washington national service office of York Corp., has been named district manager of the company's California operations with headquarters in Los Angeles.

Changeover from FREON-12 *to* METHYL CHLORIDE

By Alex Gordon

Here are the answers to two important questions: Is it practical? Can you satisfy your customers?

IT HAS recently been stated by a qualified source that in spite of the increased capacity for producing Freon-12, it will be a scarce item for the duration of the war, and further, that when the war is concluded the many new uses of Freon-12 in insecticides and other products may limit its use in refrigeration at that time.

To the serviceman who has a machine down and can't get Freon-12, opinions and predictions are no solution. His job is to maintain refrigeration, and his first thought, as the next best thing, is to substitute methyl chloride.

A poll among 100 busy service men, who specialize mostly in commercial work, has revealed that in the majority of these changeovers little or no trouble was encountered. This is largely due to the fact that most installations have an overcapacity that will compensate for a great percentage of the losses. Nearly every one of the men interviewed was careful to mention the fact that methyl chloride must not be used in machines that have gaskets or other parts made of aluminum, zinc or magnesium.

Polled Service Men

Here are a few of the questions the service men were asked:

Has the shortage of Freon-12 inconvenienced you much in your servicing business?

Did you notice any difference in performance?

What about changing expansion valves?

How about the jobs that gave you trouble. What was the cause?

How about your back pressure devices, such as snap-action and two-temperature valves?

Here is what the service man says:

The service man is our field representative. He meets his problems squarely, solves them, or can tell you why they can't be solved. His is practical, first-hand information.

The addition of methyl chloride to a Freon-12 system up to 25 per cent does not cause any noticeable difference in operation. If over 25 per cent is required, it is a general practice to remove the Freon-12 and replace entirely with methyl chloride.

In most cases the expansion valve on the job, by resetting the superheat, performs o.k. If the valve is defective or of the non-adjustable type, it is changed.

Water-cooled jobs did not give any trouble, but air-cooled jobs sometimes required an increase in speed.

All pressure-operated controls and devices require resetting.

The manufacturer can give us valuable assistance. He is in constant touch with his designers and engineers. His opinions, however, must necessarily be tempered with great caution, because the blame for failure would rest squarely on his product, if the balance of the refrigeration system were not carefully examined.

While it is quite commendable to follow the exacting precautions prescribed by the manufacturer, it is very often the tendency of the practical service man to take short-cuts.

What Manufacturers Say

A valve manufacturer says:

Yes, Feon-12 valves can be left on a system converted to methyl chloride, but certain adjustments must be made to insure the best operation. After adjustments have been made, the service man should permit the machine to cycle two or three times, to allow for checking the operation.

Another valve manufacturer says:

When changing the refrigerant in a system, the thermostatic expansion valve should also be changed to the corresponding refrigerant. This practice should be adhered to at all times, to eliminate service difficulties. In some cases it is possible to use a Freon valve on a methyl application. However, in doing so, you violate various advantages that have been provided for in the proper recommended refrigerant valve.

For example, a particular Freon valve has an adjustable superheat range of 0° to 30° F. This valve is ordinarily set at 10° superheat. If the

ABOUT THE AUTHOR

ALEX Gordon, who in this article relates the experiences of one hundred practical refrigeration service men in making changeovers from Freon-12 to methyl chloride, is himself a man of long experience in the field of refrigeration.

In addition to operating the Gordy Refrigeration Service, and acting as secretary of the Greater Chicago chapter of Refrigeration Service Engineers Society, Mr. Gordon also is an instructor and writer of text material for Commercial Trades Institute, Chicago refrigeration and air conditioning school.

same valve is used on methyl chloride, your superheat setting would automatically be lowered to 0°. If you should turn the valve adjusting stem on a Freon valve to a maximum setting of 18°, the corresponding setting on a methyl chloride application would be 7°.

You can readily see that your range of superheat would be cut down considerably, and as a result you could not expect to profit by the advantages built into the valve specially designed for a methyl chloride application.

Here is a report by one manufacturer's engineer who has conducted an experiment with a regular refrigeration system:

This system was tested with various quantities of refrigerant, starting with 100 per cent Freon-12, then with a mixture of 75 per cent Freon-12 and 25 per cent methyl, 50 per cent of each, 25 per cent Freon and 75 per cent methyl, and 100 per cent methyl.

It was found that as the percentage of methyl increased, it was possible to maintain the room temperature at higher evaporator temperatures, so that the capacity of the system increased slightly. This indicated that the addition of methyl, because of its better heat transfer, improved the performance of the lowside. The head pressure on the compressor increased to that above pure Freon. This condition improved itself, and with a mixture of 25 per cent Freon and 75 per cent methyl the head pressure dropped to what it was when using 100 per cent Freon-12.

An increase in the percentage of methyl from this point showed better capacity and b.t.u./hr. requirements over that of Freon-12.

It can be seen that from a performance standpoint, the substitution of methyl chloride into a Freon-12 system does not reduce the capacity, because there is an improvement in the evaporator performance; and that the greater the percentage of methyl, the more improvement in over-all system performance.

Therefore, if we ignore some of the complications of control settings, etc., we found no objection to mixing the two refrigerants or making up the deficiency in a Freon-12 system with methyl chloride.

Similar findings have been reported by several well-informed engineers.

Step-by-Step Procedure

General Inspection:

Machine should be inspected to assure that all mechanical parts are in good operating condition, and that sludge. copper plating, etc., are absent.

If necessary, mechanical parts should be replaced, machine should be cleaned of sludge or copper plating, dehydrated, and otherwise put in shape for normal operation.

Oil:

In changing from Freon-12 to methyl chloride, the oil, if of proper viscosity for Freon-12, need not be changed where methyl chloride is used, provided the oil is in good condition. When Freon-12 is withdrawn from the system, it contains a considerable amount of oil that it has picked up from the compressor.

When methyl chloride is put into the system, it, too, will pick up oil from the compressor, and as a result the oil level will be lowered. Check the oil level after changing over, and again the next day—and add oil if necessary.

Refrigerant Removal:

To remove Freon-12 and leave most of the oil in the machine, close the valve to the condenser, and connect a cylinder of proper size to the outlet from the compressor.

Place the cylinder in cold water and operate the compressor until all the refrigerant has been transferred to the cylinder. Some oil will come over with the Freon-12.

In removing any refrigerant from a water-cooled condenser, do not remove too rapidly. The rapid expansion of the refrigerant may freeze up the water in the tubes in the condenser, and cause them to burst.

WARNING: The cylinder must not be overloaded with liquid refrigerant. Overloaded cylinders are dangerous.

Continued on page 43

STEP-BY-STEP CHANGEOVER PROCEDURE

Inspect machine to make sure that all mechanical parts are in good condition.
Clean, dehydrate and put in shape for proper operation.
Evacuate system, holding vacuum of 29 inches for several minutes. Break vacuum by addition of methyl chloride. Cap all open lines when not in use to prevent entrance of moisture.
Check oil level after changing over and again next day—and add oil if necessary.
Change settings of pressure-operated controls to obtain same evaporator temperatures.
Allow sufficient superheat to assure removal of oil from evaporator.
Recalibrate float to give equivalent lifting or seating effect.
Check refrigerant change to assure proper level in receiver.
Change compressor speed, if desirable, by increasing size of motor pulley.
Check system for leaks.
Tag unit after changeover, indicating substitution of refrigerant.

CHANGEOVER ADVANTAGES

From a performance standpoint, substitution of methyl chloride for Freon-12 increases capacity of the system.
There is an improvement in evaporator performance; and the greater the percentage of methyl, the more improvement in over-all system performance.
Addition of methyl chloride up to 25 per cent causes no noticeable difference in operation.
Experience is that methyl chloride, because of better heat transfer, improves lowside performance.

UNITS NOT SUITABLE FOR CHANGEOVER

Hermetically-sealed units.
Direct-drive machines.
Systems employing float refrigerant controls.
Systems having a capillary tube refrigerant control.
Systems having any part, such as evaporators, suction or liquid line, fabricated of aluminum.
Large size comfort air-conditioning systems.

BRINGING 'EM BACK *Alive!*

- **Here's the step-by-step story of how one firm is**
- **regaining its business identity in refrigeration**

WAR casualties haven't been confined to the battlefronts. In refrigeration-wise Kansas City, for example, reliable estimates are that more that 100 of the city's approximately 170 refrigeration firms left the field in the months immediately following Pearl Harbor, as a result of the initial impact of manpower and material limitations.

But they do come back, and when they do it's a start-from-scratch proposition, with customer contacts to be renewed, new sales and service crews to be picked—and in the case of Universal Refrigeration and Air conditioning Service, an entirely new business identity to be established.

A leading factor in the Kansas City sales and service field since 1929, the organization, under the management of E. G. Jackman and Clint Hendrix, was disbanded in 1941 and the owners went into defense construction work. The men had determined to get back into refrigeration, however, and last July began to rebuild their organization.

Although initial emphasis necessarily is on servicing, the company has set up a strong program designed to push it into a favorable position for postwar commercial refrigeration equipment merchandising.

Took New Name

United Refrigeration Sales and Service was the name under which the firm originally had operated, but this title had been assumed by two other companies; the men then decided to adopt Universal Refrigeration and Air Conditioning Service as their new name. Under that title they are conducting a campaign designed to boost their firm to the top again. In each of the months since reopening, there has been an increase in business.

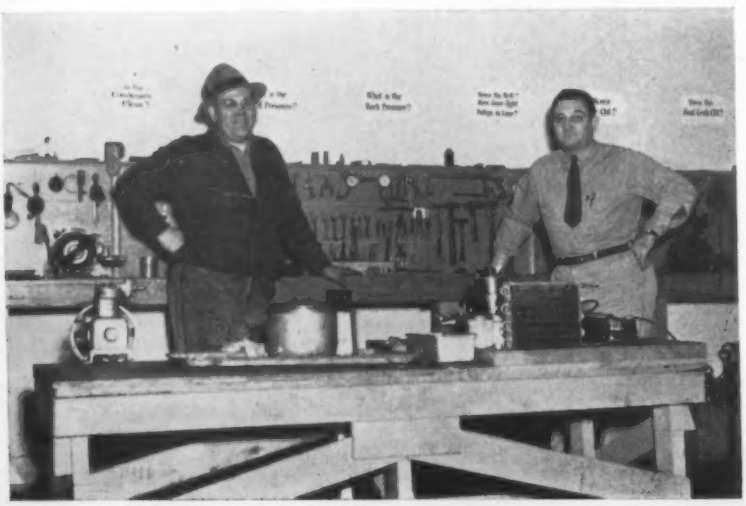
The partners were able to lease a building in a busy suburban section of Kansas City, only a few doors from the building they formerly occupied. Four service engineers, all of whom had been engaged in refrigeration service since 1925, were hired, and with the two owners and a typist-bookkeeper, make up the present staff.

In the initial outlay for equipment, the men have been cautious; additions have been made carefully and gradually, with an eye on trend of business and the war picture. Currently, the firm is operating with a drill press, a paint booth, volt meters, air compressor, baking oven, run-in-rack, low side float calibrator. A new lathe will be added soon. Four service cars answer service calls.

Building Sales Staff

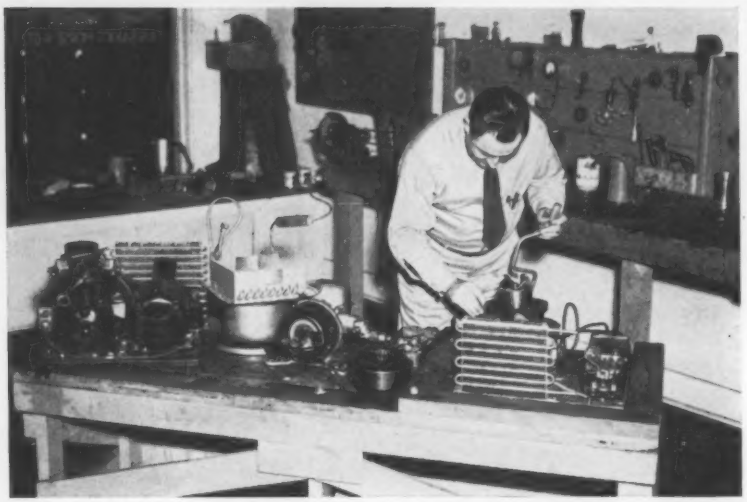
Physical facilities of the building Universal Refrigeration now occupies are favorable. There are three spacious rooms with convenient doors opening into each room, and a roomy basement which can be used for additional storage space. One room is used for the shop, one for storage and the third is utilized for the office, with adequate space here for displaying postwar merchandise.

The firm is starting now to build a sales staff that will function smoothly and effectively when merchandise is again available. Universal Refrigeration will be a strong bidder for the dealership of a well established line of commercial refrigeration equip-



E. G. Jackman (left) and C. H. Hendrix left the refrigeration field after the war brought on problems. But they've re-established their business now and are preparing for the big things ahead in refrigeration.

The war cost this company its customers, its sales and service crews—even its name. But now it's on the comeback trail.



Giving top service to refrigeration customers now is one phase of Universal's postwar planning. The two owners keep a personal eye on activities in their repair shop. Here Mr. Hendrix inspects a piece of repair work.

ment, as well as low-temp storage units.

But, while keeping the future well in mind, present prospects are not overlooked. The firm services one-third of the air-conditioning units in Kansas City and surrounding territory; services, repairs and installs steam and hot water heating plants, and is one of the few concerns in the city offering service on Grunow units.

"Most important phase of postwar plans is the *postwar customer*," observes Clint Hendrix, "and our wartime service customer will be our postwar sales customer. We never forget that as we attend to the small details of our contacts with him. We never forget it in our telephone conversations, our correspondence, in our personal relations.

"We remind ourselves that when a service customer is impatient, even unreasonable in his demands, that he probably has a refrigeration unit that, like most others, is going to go to 'refrigerator heaven' after the war. It, like hundreds of others in our city, has worked overtime.

"So we keep our voices even, we're patient. Because there, we say, is the essential cog of our postwar plans. When we kick him in the teeth, we might as well file our postwar plans in the wastepaper basket."

Keeping the postwar customer in mind is everyday routine at Universal. Mechanics cover all service calls received before 3 p. m. that same day. Rush attention is given emergency calls from meat markets, restaurants, all places where mass food protection is necessary. It's patriotic—and good business. An effort is always made to tidy up the client's floor, clearing away all debris, after servicing a machine at Universal.

Preventive Work Pays

The firm offers a periodical check-up service on commercial units and multiple units, and frequently uncovers minor faults before they reach a troublesome stage. Clients like this service, often voice their appreciation of it.

In spite of the fact that a major portion of its business is derived from big accounts, the firm never deviates from its policy of giving small units the same, speedy, careful, courteous attention it gives a 100-ton refrigeration unit.

One notable feature in the company's comeback is its diligent promotional program. Daily advertisements are sponsored in the city's leading daily. Ads are also carried in a good community newspaper, and in weeklies in the nearby country towns.

Ads are usually either of the small display type, or inserted in the classified columns, and the steady pound-pound, day after day, has proved a real business-getter. Classified ads are usually along this order:

"Refrigeration Service — All makes; Grunow specialists; household, commercial air conditioning; out-of-town repairs solicited; 18 years of successful experience."

Letters Bring Jobs

Two form letters have been of great value in regaining prestige for the firm. After the reorganization, this letter was mailed to former customers:

Upon checking our records under the United Refrigeration Sales and Service, 4721 Troost, we find that we have served you. We are attempting to re-establish your patronage.

When this country entered the war we could not secure material and continue service with inexperienced help, so we closed and entered defense construction work. Now we are happy to inform you we can serve you efficiently again with competent mechanics.

Should you need us—we will enjoy answering your service call and renewing our friendship.

The letter has been well received by former customers of the firm and has brought many back into the fold.

Continued on page 49

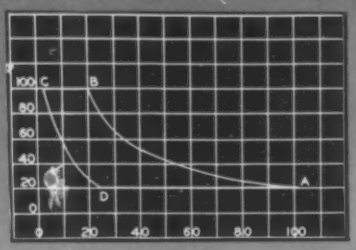


Figure 1

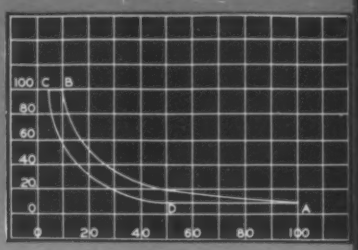


Figure 2

HOW'S YOUR *Volume*

It's easy enough to tell a customer his compressor won't pump worth a hoot—but can you tell him why? Here's what has happened—and the reasons—when a unit can't handle the job for which it was designed

By George W. Clark

OUR hero, Little Elmer, the super service man, looks up from the 1919 model Freezemquick and says: "Mister, your volumetric efficiency has declined to the extent that the capacity of this reciprocating mechanism is no longer great enough to circulate enough working fluid to remove heat from the evaporator at the desired rate."

"Chee," says the innocent but admiring customer, "how bad is it, doc?"

"Well," says Little Elmer the s.s.m., "in the language of the trade, it's all shot to..... blazes."

"How long will it take, how much will it cost, and what kind of a priority do I need to get me a brand new volumetric sufficiency?" says our innocent customer.

* * *

PERHAPS the usual conversation between the service man and his customer doesn't follow the exact wording above. However, the idea is there. More probably, the service man just says the compressor doesn't pump worth a ..... and it should be fixed.

Actually, if the compressor turns at its usual rate of speed, and the piston continues to move up and down but still the quantity of refrigerant moved is below normal, the volumetric efficiency of the compressor is low, because volumetric efficiency is a ratio between the actual volume of gas drawn into the compressor for each operation and the quantity of gas that would be drawn in by a perfect compressor. Or, stated in another way, volumetric efficiency is the ratio between the volume of gas at suction pressure actually pumped in a given length of time to the displacement of the compressor for the same length of time.

The displacement of a compressor having one cylinder would be

$$\frac{\Pi d^2 \times 1 \times r.p.m.}{4}$$

where $\frac{\Pi d^2}{4}$ is the area of the piston in square inches (d=diameter of piston), 1 is the length of stroke of the compressor, and r.p.m. is the compressor speed. The displacement of the compressor would then be found in terms of c.i.m., or cubic inches per minute. More often, displacement is wanted in terms of c.f.m., or cubic feet per minute, which is the displacement in cubic inches per minute divided by 1728. If the compressor had more than one cylinder and n stands for the number of cylinders, the displacement of the compressor would be

$$C.F.M.=\frac{\Pi d^2 \times 1 \times n \times r.p.m.}{4 \times 1728}$$

As an example, a compressor having two cylinders of 4" bore and 3" stroke and turning at 500 r.p.m. has a displacement of

$$C.F.M.=\frac{\Pi \times 16 \times 3 \times 2 \times 500}{4 \times 1728}=2.19$$

If the above compressor was actually pumping one pound of refrigerant vapor per minute, and the volume of a pound of the vapor at the suction pressure and temperature was 1.5, the volumetric efficiency would be

$$V.E.=\frac{1.5}{2.19}=.6875 \text{ or } 68.75\%$$

If the suction pressure was quite low and the discharge pressure quite high, 68.75% volumetric efficiency would rate from fair to average. At comparatively high suction pressures

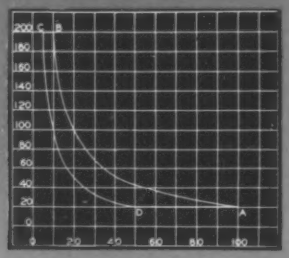


Figure 3

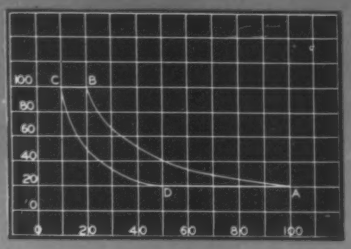


Figure 4

...ic Efficiency?

and comparatively low discharge pressures, the volumetric efficiency should be as high as 80 to 85%.

In Little Elmer's case, the compressor was running all the time and was still unable to hold the temperatures low enough. Probably it pumped only one fifth of a pound of vapor per minute, or .3 cubic feet. In which case

$$V.E. = \frac{.3}{2.19} = .137 \text{ or } 13.7\%$$

so that the statement made by Little Elmer is entirely correct.

The reason the volumetric efficiency is low is another matter, and a discussion of the various causes of low volumetric efficiency is the purpose of this article.

For the usual type of single-acting piston compressor to have high volumetric efficiency, the leakage by the piston must be held to a minimum, the suction and discharge valves must not leak, and the clearance volume in relation to the volume displaced by the piston during its compression stroke must be very small. The clearance volume is the volume in the cylinder between the piston and the discharge valve when the piston is at the top of its stroke.

To illustrate the effect of clearance volume on volumetric efficiency the pressure-volume relationship that exists in a compressor cylinder is shown in Figure I. For ease of illustration, a compressor is considered in which no change in temperature takes place during compression, which is not a normal condition but makes the product of pressure and volume constant during compression, which helps in the explanation.

In Figure I, the compressor is considered to have perfect valves, no leaks by the piston, and the clearance volume is taken as 5% of the total volume of the cylinder with the piston at the bottom of its stroke.

Referring to Figure I, the volume at A is shown as 1 cubic foot and the pressure as 20p.s.i.a. (pounds per square inch absolute). As the piston moves up in the cylinder, the volume is reduced and the pressure increases. When the volume is reduced to .20 cubic feet and the pressure is up to the discharge pressure of 100p.s.i.a., the compression is complete, as at B.

As the piston continues to move, the volume in the cylinder is reduced to the clearance volume of .05 cubic feet, as at C. From B to C the compressor was not compressing, but discharging vapor through the discharge valve. From C to D the clearance volume of the gas at 100p.s.i.a. is expanding down to the suction pressure of 20-p.s.i.a. and a volume of .25 C.F., and from D to A a fresh charge of vapor is being drawn into the compressor.

In this compressor, the volume of gas actually pumped per stroke is the volume at A minus the volume at D, and the displacement of the compressor is the volume at A minus the volume at C. So the volumetric efficiency is

$$\frac{A\text{-}D}{A\text{-}C} = \frac{1.00 - .25}{1.00 - .05} = \frac{.75}{.95} = 79\%$$

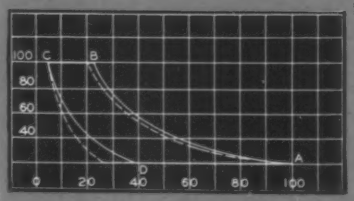


Figure 5

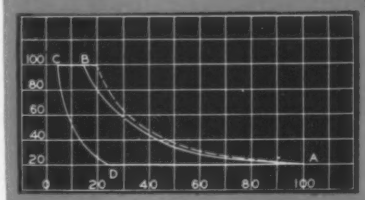


Figure 6

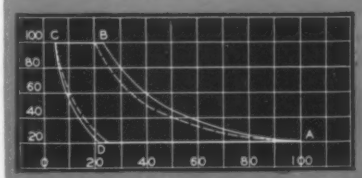


Figure 7

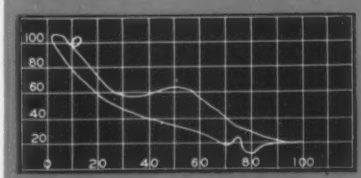


Figure 8

Figure II shows a pressure-volume diagram for the same compressor when the suction pressure has been reduced to 10p.s.i.a., or one half of the volume after compression in Figure I. Also, the volume at D is greater than in the original case. The volumetric efficiency for this case is

$$V.E.=\frac{A\text{-}D}{A\text{-}C}=\frac{1.00—.50}{1.00—.05}=\frac{.50}{.95}=52.5\%$$

One Cause of Drop

The study of Figure II and conditions which contribute to the lowered volumetric efficiency lead to several conclusions. These are that low temperature applications, and thereby low suction pressures, tend to produce lower refrigerating effect in two ways: namely, reduction of specific volume of the refrigerant itself, and lowered volumetric efficiency.

The former effect varies about directly as the absolute suction pressure, while the latter effect is appreciable, but not as much. Thus the capacity of a constant speed compressor, to produce refrigeration, decreases proportionally faster than the absolute suction pressure.

Expansion valve settings too low, restricted suction lines, restricted suction service valves, restricted suction ports, etc. all tend to give the reduced volumetric efficiency explained by Figure II.

Higher Discharge Pressure

Figure III shows what happens when the compressor discharge pressure is increased. In this case the volumetric efficiency is

$$V.E.=\frac{A\text{-}D}{A\text{-}C}=\frac{1.00—.50}{1.00—.05}=\frac{.50}{.95}=52.5\%$$

The reduced volumetric efficiency, in this case, may result from high temperature air or water for the condenser. It may also result from dirty condensers, poorly designed or directed fans, undersize condensers, too much refrigerant in condenser cutting down condensing area, restricted lines from compressor to condenser, restricted discharge service valve, restricted discharge ports, or discharge valve spring pressure too great. In water cooled condensers, restricted water coils and insulating scale in water coils also produce the same results.

Figure IV shows a reduced volumetric efficiency due to increased clearance volume. In this instance the volumetric efficiency is

$$V.E.=\frac{A\text{-}D}{A\text{-}C}=\frac{1.00—.50}{1.00—.10}=\frac{.50}{.90}=55.5\%$$

In general, low volumetric efficiency due to too much clearance volume may be a matter of the original compressor design. However, a number of things may happen to a compressor during its lifetime to increase the clearance volume. Among these may be listed wear of main bearings, tending to lower the crankshaft, wear of connecting rods or eccentric straps, added gaskets or gaskets that are too thick between the cylinder and discharge valve plate, dished valve plates or piston tops, etc.

Leaky Discharge Valve

Figure V shows the result of a leaky discharge valve by comparing the actual compression and re-expansion lines as solid lines, with the dotted lines showing compression and re-expansion for the same conditions, but without the leaky valve. In this case vapor leaks from the high pressure side of the system into the cylinder during compression, during re-expansion, and during the intake from D to A. The volumetric efficiency cannot be taken from this diagram, since the volume of the vapor at A is made up of gas which has leaked back through the discharge valve plus only part of the difference between A and D.

Leaky Suction Valve

Figure VI shows the result of a leaky suction valve. In the instance shown, the volumetric efficiency cannot be read from the diagram, as the difference between volume A and D is made up partly of fresh vapor drawn in through the suction line and partly of vapor that leaked back through the leaky valve during compression, discharge, and re-expansion. This same condition will result from leaks by the piston, which in turn results from scored cylinders, loose pistons, piston rings stuck in grooves, insufficient oil on cylinder walls etc.

Figure VII shows the general shape of the compression and re-expansion lines for a normally operating compressor in which the temperature changes during compression and expansion. In the diagram, the volumes result from an increase in temperature from 40 to 140° F. in compression. In compressor operation, the extent of cooling during compression by means of air passed over the cylinders or by means of water jackets affects the volumetric efficiency only slightly, unless due to overcooling some condensation takes place in the cylinder itself. The re-expansion then becomes an important factor, and may reduce the volumetric efficiency down to as low as 10%.

Little Elmer's Problem

Figure VIII shows the alarming state of affairs that concerned the compressor under treatment by Little Elmer Sadsack of Omigosh, Kansas, and a complete discussion of its troubles can best be obtained by contacting him direct.

Summary of Causes

To conclude, we may summarize as follows:

1. A service man would be technically correct, if, instead of saying the compressor doesn't pump worth a ....., he merely states that its volumetric efficiency has declined to a very low level.

2. A decline in volumetric efficiency may result from

(a) Low suction pressure due to

1. Expansion valve setting too low.

2. Suction line too long for its diameter.

3. Restrictions in suction line, suction service valve, or suction inlet port.

4. Spring tension too great on suction valve in compressor, requiring high pressure difference to open.

(b) High compression pressure due to

1. High temp air over condenser.

2. Air or non-condensable gases in system.

3. Condenser too small with respect to cooling surface.

4. Condenser tubes too small.

5. Restricted tube to condenser.

6. Restricted discharge service valve.

7. Restricted discharge port.

8. Too much spring pressure on discharge valve.

Continued on page 56

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Everyone knows that no one charge can give peak performance on all applications.

For example, no *standard* charge will do for ice cream cabinets . . . farm freezers . . . home freezers and locker plants. All of these are low temperature applications and in order to give the best possible performance they demand a thermostatic expansion valve that is charged specifically for low temperature work.

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"Let's share our knowledge—exchange our experiences"

Here's how

Edited by
Warren W. Farr

Training Pays

Servicemen, properly trained, can perform all types of service operations on all types of equipment, and they do better work and they can take care of more service calls. The service organization that provides employee training can expect an increase in service income, together with consumer goodwill. Adequate knowledge about the equipment they are servicing will, in a large part, eliminate costly call-backs.

Fall, winter and early spring are the seasons when training programs can be most conveniently carried out. Don't put your training program off. Plan it now.

More About Gremlins

The article, "Gremlins in the Cooler," published in our January issue, seems to have been one of those things that make every refrigeration man say to himself: "Why, a thing like that happened to me a couple of weeks (or years) ago." At any rate, it has started some service men to reminiscing, as witness the following letter from B. F. Wood, of Des Moines, Iowa.

Writes Mr. Wood:

"I sure got a kick out of the Gremlins in the Cooler by R. W. Brackeen, as I have lived and survived through a few gremlin attacks myself.

"One job in particular caused a loss of that thing that Sanka will not cure. It consisted of two meat cases, a small reach-in, and a 6x8 cooler on a one horsepower water-cooled compressor that performed perfectly for three years and then decided to show off.

"The trouble developed on a Thanksgiving morning, and it appeared very simple. The pressure on the low side would not build up over 23 lbs. Naturally, I thought a couple of pounds of methyl would do the trick; but alas, no soap.

"I reset the control to cut in at 23 lbs., and the job went to work as usual, except for frosting up the coils. I checked back two days later, defrosted all of the coils and reset the control for 24½ lbs., and the pressure would not build up over 23 lbs. again.

"Well, I took off my coat and went to work in earnest. The basement temperature was 70°, the liquid level was ¼ up in the receiver, and I could start the compressor and the temperatures would all come down in all of the fixtures—but the control would not close by itself at 24½ lbs.

"I talked to several service men and this brought nothing in regard to the solution, so I went back to this man-killer with blood in both eyes. I located a large cardboard carton and placed it under the four-valve suction manifold, and then I cracked all of the flare nuts leading to this manifold.

"My dream came true—at least four cubic feet of oil foam ran into the carton. I closed the flare nuts, reset the control to 24½ lbs., and I had the world by the tail again—well, at least for that day.

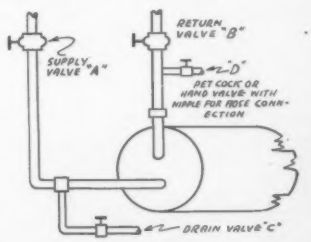
"This job is still operating, and no oil had been added before this trouble, or since."

WANTED: YOUR IDEAS

Keeping refrigeration equipment in operation means, especially in these days, working out practical solutions to many routine servicing problems.

Exchanging our experiences with fellow engineers helps us all do a better job.

Send us that idea you're using —that simplified procedure, safety suggestion, new servicing tool, better way to do a job. Give us a brief description, and perhaps a rough sketch to help get the idea across. THE REFRIGERATION INDUSTRY pays $5 for each idea published.



Keeping Condensers Clean

Here is an interesting bit of information from E. M. Nelson, of New York City, describing the method he has developed to keep condenser tubes clean. It supplements the article, "Safe and Simple Water Scale Removal," which appeared in THE REFRIGERATION INDUSTRY for September, 1944.

"I was very much interested in Mr. G. E. Wilder's method of cleaning condensers, as published in your September issue," Mr. Nelson says.

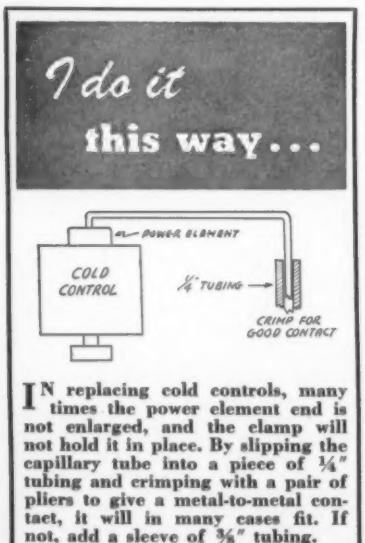
"In the past we found it necessary to wire brush our condenser tubes at least twice a year due to the dirt and scale from our cooling tower settling in the tubes and impairing the rate of heat exchange.

"Attached is a rough sketch which depicts the method we now use to keep our condensers clean. The following is the procedure:

"Close valves A & B, open drain valve C, open stopcock D allowing air to enter, and all the water in the condensers to drain off. When this is completed, close stopcock D and open valve B, which will allow the water to flush through the tubes. The turbulence set up by the water and the air will remove all loose deposits in the tubes. This method, if applied about once a week or as needed, will allow very little scale and dirt to settle in the tubes.

"If it becomes necessary to use a solvent, we simply erect a barrel on a platform higher than the condenser, pour in our solution, connect a rubber hose from the barrel to the stopcock, and as the water drains out of the condenser allow the suction to draw in the solvent. When the barrel is empty we close drain valve C and allow the solvent to remain as long as necessary, draining it off in the manner described above.

"With the use of the above method it is only necessary to use a solvent about every two years or more, and it has practically eliminated the necessity of 'punching' the tubes."



IN replacing cold controls, many times the power element end is not enlarged, and the clamp will not hold it in place. By slipping the capillary tube into a piece of ¼" tubing and crimping with a pair of pliers to give a metal-to-metal contact, it will in many cases fit. If not, add a sleeve of ⅜" tubing.

Joe Gerson, Jackson, Tenn.

WHAT'S YOUR SCORE?

Following are five questions that every serviceman should be able to answer. Give yourself twenty points for each question you answer correctly. Your score should be at least 80.

1. What is heat?
2. In what direction does heat flow?
3. Name the three basic methods of heat transfer.
4. How is it possible to make a refrigerant boil without raising its temperature?
5. State two methods of cooling a condenser.

ANSWERS: 1. A form of energy; 2. From substance of higher temperature to one of a lower temperature; 3. Conduction, conviction, and radiation; 4. By reducing the pressure on the container; 5. Water cooling and air cooling.

If You Can't Make a Sale, Make a Friend

Two salesmen were talking and one said to the other, "Have a good day?" The second man said, "Well I made a lot of good contacts." To which the first salesman replied, "I didn't make any sales either." But all joking aside, the next best thing to an order is making a friend. We plant the seed at every call—and it's one of the A-B-C's of good selling to be darned sure that if a sale doesn't grow right away, we at least are careful to leave the plant growing just a little higher at each call.

Promote Winter Servicing

Many contractors report that the extreme rush service of July and August can be partially prevented if preventative service is rendered during the fall and winter months.

The usual plan used to promote winter service is to advise your customers, on a printed one-cent postal card, that delays can be prevented in rendering service if they will have their equipment inspected and adjusted during your slack season. You can further point out that parts are readily more available while the demand is low.

These cards can be mailed out daily in small quantities, so that your service department can take care of the responses with very little delay. If, at any time, your calls get ahead of you, mailings can be suspended for the time being. Many service organizations report as high as 50 per cent response to postal card mailings.

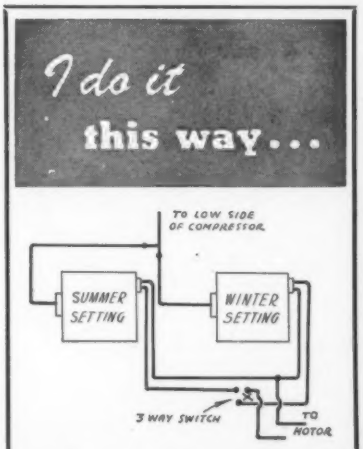
Service DO's and DON'T's

DO:

1. Use gauges if necessary.
2. Check for gas, use sight glass.
3. Check for noncondensable gases or air.

DON'T:

1. Pull up too tight on tubing flares; you thin out the face and break something.
2. Tell the customer too much of your business.
3. Heat gas drum before opening valve.



HERE is an idea which I have found very practical and a time-saver where condensing units are set up in cold locations and difficulty is experienced in getting sufficient running time during cold weather.

Normally installations of this type require a service man's attention twice a year to reset the control. The idea sketched here eliminates the necessity of this, and in addition results in a nice sale of additional equipment for the refrigeration service contractor.

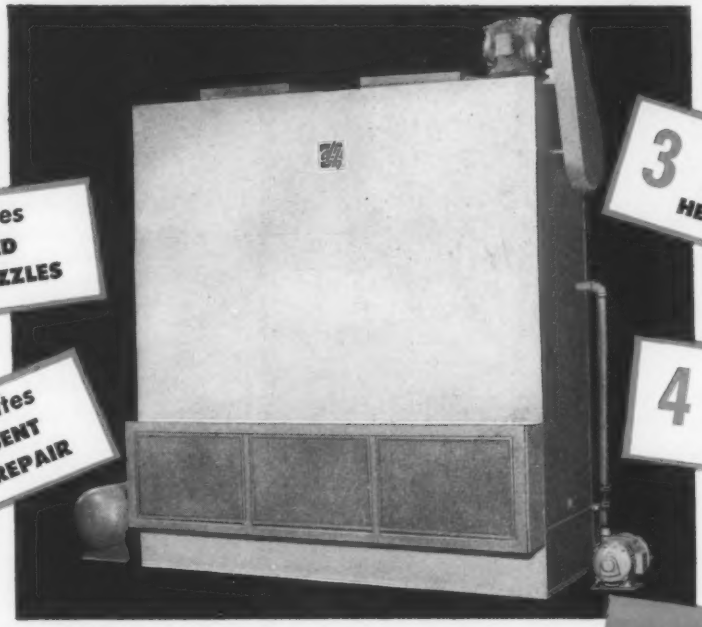
A flip of the three-way switch is all that is required to change over the equipment from winter to summer operation.

Eugene Szabo, Garfield, N.Y.

d-h WAT-R-MISER

evaporative condenser with built-in air filter

GIVES YOU 4 IMPORTANT ADVANTAGES



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You'll save fully 90% of ordinary evaporative condenser service expense with **Wat-R-Miser** . . . and get maximum performance, too.

Built-in all-metal air filter . . . removable, washable and rust-proof assures clean air in the system. Pitched tube condensing coils eliminate "bottling up" of gas and liquid . . . keeps all of the condensing surface working all of the time. These outstanding features, plus sturdy construction, combine to give you maximum efficiency, economy and dependability for which **Wat-R-Misers** are famous.

They are made in 16 sizes . . . capacities from *five to 120 tons,* and designed for use with all refrigerants. Enthusiastic users with the most exacting requirements say **Wat-R-Miser** gives peak performance at minimum cost.

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So enthusiastically have these Plans been received that, in 1944, the number of motors repaired or exchanged rose to several thousand a month. Here's evidence that there's a growing business in servicing fractional-hp motors that have become inoperative. And if you're prepared to handle such work *quickly, expertly,* and *economically,* with convenience and satisfaction to your customers, you can get your share of this profitable business.

Ask your appliance manufacturer or distributor, today, for details on how to put these Factory Service Plans at work for you. Or simply fill in and mail the handy coupon.

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3. **REGULAR REPAIR PLAN.** Covers f-hp motors not included in either of the other two plans, except extremely old or obsolete models. Inspection is made at the factory, and a cost estimate is submitted before work is started. These motors also carry the G-E new-motor warranty, except for finish. This plan rounds out this G-E service and enables you to handle repairs on practically any G-E fractional-horsepower motor.

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Please send me a copy of your booklet which describes your three Plans for servicing fractional-horsepower motors.

Name.....

Company.....

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.....

MANPOWER . . .

Continued from page 16

to the local draft board, and often to the state board and beyond.

With the peak of the refrigeration servicing season only a few weeks away, the loss in time alone, even if a deferment were granted in each instance, required to prepare and carry through these appeals would represent a diversion of manpower which the industry, in most communities, could ill afford, he contends.

Sensing the need for immediate action, the National Council has scheduled a meeting with a panel of individuals in WMC who have charge of the classifying of various industries. A resolution has been prepared for presentation at that meeting, urging that repair men and engineers be returned to the "critical" classification.

As background information for its use in presenting the industry's manpower problem to WMC, the National Council has asked local Councils for:

Specific examples of reclassification of experienced repair men into 1-A by local boards.

Specific local instances where draft boards have requested repair men to enter war plant work.

Number of experienced refrigerator repair men normally employed; number of trainees now employed; number of experienced men now employed; number needed to safely maintain refrigeration equipment in the particular community.

THE installing of expansion valves of wrong capacity is a very common error. Use the nearest size as recommended by the manufacturers of the valves. In emergency conditions such as we now have, you may have to use the next larger size. Remember the orifice is restricted, in most cases, by a plunger or a pin, and the valve will require a little adjustment. Too small an orifice tends to starve the coil or low-side.

Many valve manufacturers have two types of valves—one for use with high temperatures and the other for low temperatures. You will not be able to get the low temperature valve to feed properly as it has a maximum opening pressure. The use of high temperature valves on freezer jobs might easily overload the motor. Be sure to check the valves before installing them.

J. R. Stitt, San Francisco, Cal.

A GOOD UMBRELLA MAY KEEP YOU DRY

but . . .

. . . wouldn't a refrigeration engineer look foolish holding one over a cooling unit!

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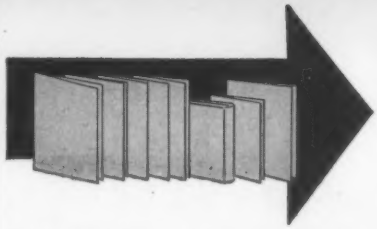

Useful Literature

The publications featured on this page were written by experts. They are FREE publications. To obtain these write to THE REFRIGERATION INDUSTRY, 812 Huron Road, Cleveland, 15, Ohio. If there is some delay in receiving the material requested, please understand that this is due to our operating with a minimum staff. We shall put through all requests as rapidly as possible.

124—Vises . . . A bulletin (348) listing details, specifications, and prices of its line of "Pilgrim" vises for machine shop use. Issued by Chicago Tool & Engineering Co.

125—Tube Parts . . . An attractive brochure describing the diverse operations employed in fabricating tubular parts of seamless copper, brass, and aluminum, and listing data on safe working pressure, tolerances, decimal equivalents, weights per foot, etc. Issued by Wolverine Tube Division of Calumet & Hecla.

126—Lubrication Data . . . A 48-page technical bulletin, "Lubrication of Refrigeration and Air Conditioning Equipment", containing in addition to lubrication data information on types of refrigerating systems, functions of essential parts, refrigerant characteristics, applications of refrigeration, and effect of refrigerants on oils. Issued by Sun Oil Co.

127—Insulating Glass . . . Presentation by Libbey-Owens-Ford Glass Co. of the properties and uses of Thermopane insulating glass in home and business.

128—V-Belts . . . A 12-page catalog listing information required to make correct V-belt drive selections. Includes charts, tables and drawings. Issued by Allis-Chalmers Mfg. Co.

129—Capacitors . . . A bulletin (GEA 4388) containing complete information on its new line of paper-dielectric capacitors. Issued by the General Electric Co.

130—Fans . . . Complete technical information and performance curves on its line of fans developed for various industrial uses. Issued by Dynamic Air Engineering, Inc.

131—Electrical Connecting Devices . . . A new 32-page catalog (No. 4) illustrating and describing its complete line of multi-contact plugs and sockets, terminal strips, fuse mounts and other electrical connecting devices. Issued by Howard B. Jones Co.

132—Electrical Specialties . . . Three bulletins released by Minerallac Electric Co. on its line of steel hangers, pipe-clamp clips, steel straps for outlet boxes, porcelain insulating bushings, and insulating and cable-pulling compounds.

133—Condenser Protection . . . A new bulletin issued by Condenser Service & Engineering Co. describing "Flowrites", short belled-end metal inserts which protect condenser tube inlets against erosion. Includes installation data and reports of test results.

134—Tube Fabrication . . . A book issued by the Formed Steel Tube Institute, of interest primarily to product designers and engineers, illustrating and describing peace time and war time uses of steel tubing, and containing specifications for various tubing applications.

135—Bearings . . . A revised bulletin (No. 105) entitled "High Capacity Ball Reciprocating Bearings", covering new list of recommended sizes, and pertinent engineering information. Issued by Bantam Bearings Division, The Torrington Co.

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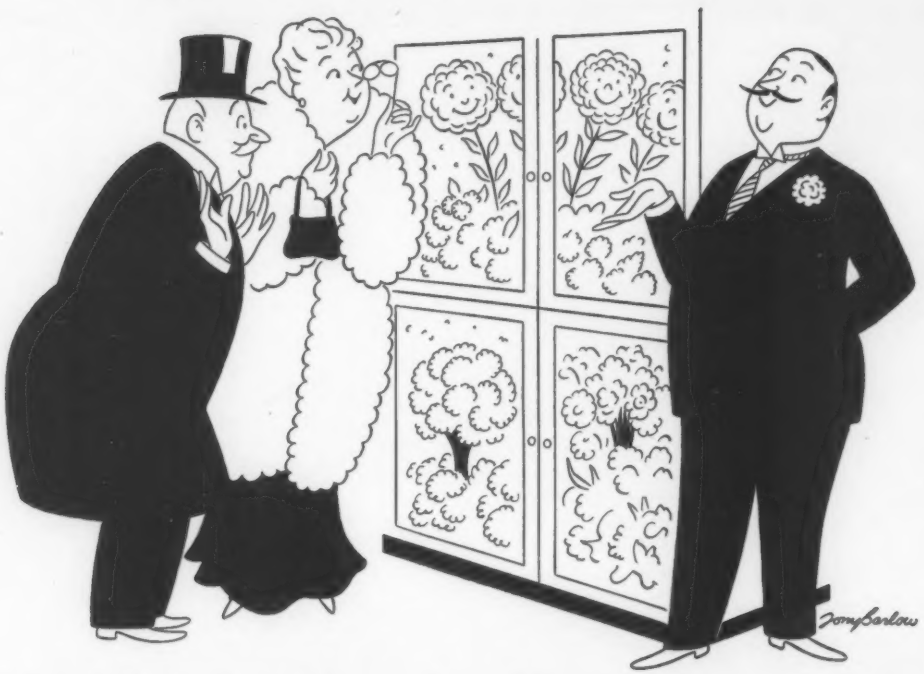
3-45

Happy Tales of Trouble-Free Performance



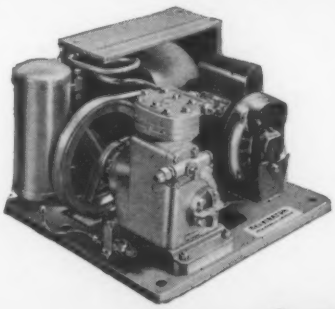
Customer: *"What's going on here?"*

Manager: *"It's funny, but those flowers have been happy ever since I put in that new Kelvinator Condensing Unit!"*

For 30 years the outstanding leader in commercial refrigeration. That's why Kelvinator Condensing Units are famous for giving *more* dependability, *more* economy, *more* performance.

That's the reason progressive service men *always* specify Kelvinator.

Kelvinator distributors and zone offices stock a complete line of refrigeration supplies. See them for your installation material such as tubing, controls, dryers, etc.



Kelvinator

DIVISION OF NASH-KELVINATOR CORPORATION, DETROIT

CONDENSING UNITS

SEALED • OPEN

FOR YOUR HOME—REMEMBER KELVINATOR REFRIGERATORS, ELECTRIC RANGES, WATER HEATERS AND HOME FREEZERS

Electrimatic
Regulating Valves

•

Automatic control and regulating valves for Freon, Methyl Chloride and Ammonia. A large variety of sizes and types available for practically any refrigeration requirement.

WL water regulating valves for Freon, Methyl, or Sulphur. 5/16" orifice and 3/8" FPT. Brass body construction. Large capacity—no chatter.

WP water regulating valves are available in 3/8", 1/2" and 3/4" FPT sizes. Brass body construction for Freon, Methyl or Sulphur. Easy adjustment.

WK water regulating valves are De Luxe Pilot Operated Modulating valves. Iron body, simple adjustment. Available in sizes ranging from 3/4" to 2" FPT.

WR regulating valves for Ammonia are diaphragm operated and highest quality corrosion resistant materials are used. Available in sizes ranging from 1/8" to 2" FPT.

Electrimatic valves are individually tested for efficient, economical operation. Trouble free performance.

•

Ask for a copy of our latest catalog today.

Electrimatic

2100 INDIANA AVENUE

CHICAGO 16, ILL.

Over the COUNTER

THE other day I happened across an item in the paper about an Elmer somebody who's been keepin' a "little black book" listin' all the names of the people he comes onto who use the war as an excuse for not givin' courteous service.

From what he said, he's run onto plenty of people like that in his travels around the country. And I was just thinkin' that if he had much to do with some refrigeration men I know, I'd see some familiar names in that book of his, if I was to get the chance to look at it.

Seems to me that these days, when business for most of us is waitin' around without our even havin' to put a hand out to get it, we kind of overlook some of the little things, the "extra" things, I guess you'd call 'em, that make folks our friends instead of just our customers.

For instance, most customers expect an estimate before we start on a job for them. There's a right and wrong way to furnish one. The wrong way would be to say: "You've got plenty of trouble here, Mister; it's goin' to cost you at least $35 to fix it up."

The right approach would be more like this: "Yes, you've got a little trouble here, all right; but it isn't really so serious. Had a job last week that took eight hours to whip—it cost $125. Yours only ought to take a couple of hours, and it'll only cost about $35."

Now that customers are easy to get, we ought to do some thinkin' about how we're goin' to hold 'em when conditions aren't so favorable for us. Bein' courteous is only one way.

Most of us are willing to spend plenty, in advertising and promotion, to get the names of good prospects. But what do we do to keep 'em after we get 'em? Not as much as we ought to, these days, I'm afraid.

The only kind of customer worth havin' is the one who comes back. The way things are today, a smart service dealer is darn' near in the same class as the butcher . . . customers are seekin' him out on a social as well as a business basis . . . *and he's a sucker if he don't use his opportunity now to build up a customer list that'll stand some real sales promotion when things get back closer to normal, and he's maybe not in such great demand as now.*

Right after he makes that first contact, the smart service man will get up all the information he can about that customer onto a card record.

It'll not only tell him all about the customer's present equipment, so he'll know right away what materials

to take out on a service call, but it'll have enough information on that equipment so that he'll be Johnny-on-the-Job for a new-product sale, when the time's ripe.

The card ought to furnish a running record of all sales and service to that customer . . . materials furnished, amount, and date—the last two, anyway.

Keepin' a file like that up to date may mean burnin' a little midnight oil, but you'll be surprised how much extra it'll tell you about your own business.

And these days, it really pays to know. Now and then Uncle Sam gets curious and wants to know how-come; and you'd better have figures to back up your claims or you'll wind up in the doghouse—but quick.

MONTREAL SERVICE MEN ELECT NEW OFFICERS

Ovila Fabien was elected chairman of the Mount Royal chapter of Refrigeration Service Engineers at the annual election held recently. Gordon Roe was named first vice president; R. A. Turner, second vice president; L. Letourneau, recording secretary; D. S. Greenberg, recording secretary, and R. Breault, treasurer.

WEATHERHEAD MOVES WEST COAST OFFICE

Weatherhead Co., Cleveland, Ohio, has announced the relocation of its West Coast sales office from 6039 Wilshire Blvd., Los Angeles, to 1736 Standard Ave., Glendale, where a branch plant of the company is located.

Otto Abrams, formerly sales engineer with the Cleveland division, has been transferred to Glendale to assist E. Van Vechten, West Coast sales manager, in directing the branch.

EMERY THOMPSON CO. IN NEW LOCATION

In order to produce on a larger scale for the armed forces, and, after the war, for expanded civilian needs, Emery Thompson Machine and Supply Co., manufacturer of ice cream manufacturing equipment, formerly of 271 Rider Ave., New York, has removed to 1349 Inwood Ave.

NEW DISTRIBUTORSHIP IN NEW ORLEANS AREA

O. G. H. Rasch has resigned as secretary-treasurer of the Interstate Electric Co. and Auto-Lec Stores, Inc., with whom he has been associated for 21 years, to organize a new firm, the United Distributors, Inc., to distribute refrigerators and other appliances in the New Orleans area.

K. M. Newcum (right), talks with two of the Steinhorst brothers, Henry and Fred, at the ASRE convention.

AMINCO
OIL SEPARATORS

Aminco Oil Separators protect compressors by maintaining correct oil level in crankcase and by excluding oil from refrigerant stream they enable coils, condensers, valves and dehydrators to function most efficiently.

These oil separators are made for jobs from 1/8 H.P. to 120 tons and are used everywhere, ashore or afloat, where efficient refrigeration is desired.

Full descriptive bulletins on request.

AMERICAN INJECTOR CO.
1481 - 14th AVE. DETROIT 16, MICH.

Van D Clothier, 1015 E. 16th, Los Angeles
George L. Boote, Rm. 730, 1775 Broadway, New York
W. H. Cody, Santa Fe Bldg., Dallas
Export: Borg-Warner, 310 So. Mich., Chicago

COLD FACTS BY ANSUL

EGYPTIANS MADE ICE 4,000 YEARS AGO—BY SETTING OUT WATER AT NIGHT IN POROUS CLAY VESSELS. MOISTURE "SWEATING" TO THE OUTER SURFACE EVAPORATED RAPIDLY TO CHILL AND OFTEN FREEZE THE WATER INSIDE.

RAPID EVAPORATION IS RECOGNIZED AS A BASIC PRINCIPLE OF REFRIGERATION, BUT MODERN REFRIGERATION REQUIRES MORE DEPENDABLE REFRIGERANTS—LIKE ANSUL LIQUID SULFUR DIOXIDE AND ANSUL LIQUID METHYL CHLORIDE.
—IMMEDIATELY AVAILABLE

Our technical book, "Ansul Refrigerants" (3rd Edition) available upon request

ANSUL CHEMICAL COMPANY, MARINETTE, WIS.
"Now in our 30th year"

AGENTS FOR KINETIC'S "FREON-11," "FREON-12" AND FREON-22"

BLOW-IN INSULATION METHODS OUTLINED

The method developed by Wood Conversion Co. to blow Balsam-Wool insulation into household refrigerators was outlined for members of the Detroit section of A.S.R.E. at a recent meeting by H. A. Gorman, Chicago district manager for the company.

Enough insulation to supply 1,750 household units can be carried in one railroad boxcar if the blow-in type insulation is used, Mr. Gorman said. Four carloads of the standard batt-type insulation would be needed for the same number of units, he added.

The average household box can be completely insulated within 18 seconds, Mr. Gorman declared. However, special machinery, controls, and fixtures are required if it is used.

"E" AWARD TO HENRY VALVE

In recognition of "outstanding achievement in war production," Henry Valve Co. recently was awarded the Army-Navy "E" citation in a ceremony at Chicago's Northwest Armory.

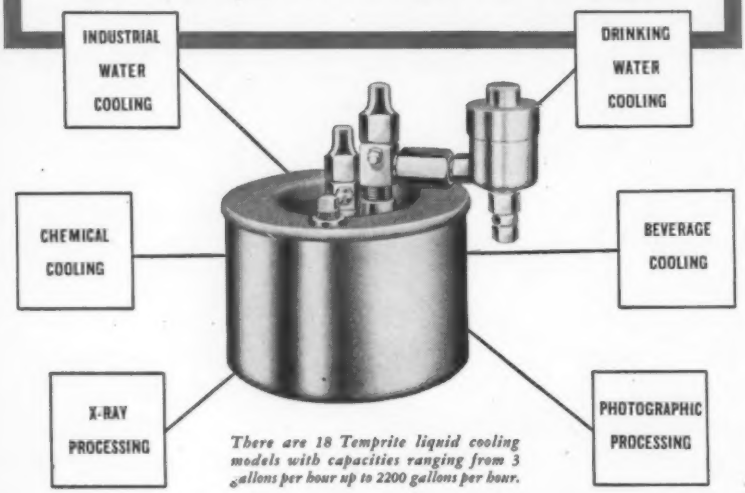
NEW JERSEY DEALER PLANS FOR POSTWAR

Eisler's, refrigeration sales and service dealership of New Brunswick, N. J., has moved to a new location at 63 French St., reports Andrew Eisler. Showroom of the new quarters is equipped for air conditioning, and a private television demonstration room has been installed.

In business since 1924, Eisler's plans post-war merchandising of household and commercial refrigeration equipment, freezer units, air conditioning, and a complete appliance line.

R. H. Money, Crosley Corp., and C. S. Leopold, consulting engineer, at lunch during the ASRE convention in New York recently.

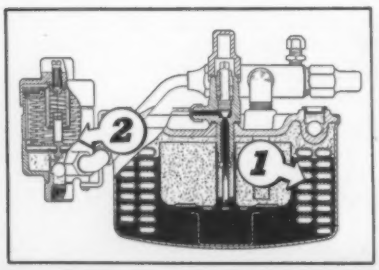
Just a few of the Applications for *Temprite* Liquid Coolers



There are 18 Temprite liquid cooling models with capacities ranging from 3 gallons per hour up to 2200 gallons per hour.

Temprite liquid cooling units have an extremely wide range of applications which should prove highly acceptable for both immediate use and postwar design.

Temprite's instantaneous cooling feature (Fig. 1 below) coupled with the super sensitive temperature control valve (Fig. 2 below) results in a cooling unit capable of producing the maximum in efficiency under all operating conditions.



Temprite exclusive design features

Instantaneous cooling principle . . . Large capacity with small size . . . Accurate temperature control . . . Wide range of temperatures available . . . Coolers constructed entirely of non-corrosive materials . . . Coils constructed of plain copper, tinned copper, or stainless steel.

★ ★

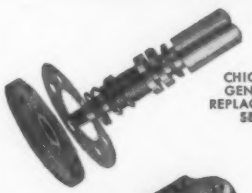
Manufacturers: Write us today for specifications on the complete line of liquid cooling units. These units available for military and essential civilian application.

TEMPRITE PRODUCTS CORP.

Originators of Instantaneous Liquid Cooling Devices

41 PIQUETTE AVENUE · · · DETROIT, MICHIGAN

Why the Trend Is Strong to CHICAGO SEALS and VALVE PLATES



Chicago Seals and Valve Plates make a better servicing job on all refrigerators, in less time, at less cost, at more profit . . . and more service men and more jobbers are finding out this fact every day.

CHICAGO SEAL CO.

20 North Wacker Drive, Chicago 6, Ill.

CHANGEOVER . . .

Continued from page 24

Weigh cylinder before transfer to determine whether its capacity has been exceeded. Better allow an extra 10 per cent margin of safety to allow for some oil content.

Freon-12 may be removed as a liquid by connecting the cylinder (in cold water) to the liquid line from the receiver and operating the compressor, as above, except that the outlet valve of the compressor is left open.

Be sure to cap all open lines when not in use to prevent entrance of moisture. Oil remaining in the crankcase may be removed through the oil port, if desired.

When completely evacuating a system it is recommended that a vacuum of 29 inches be drawn and held for several minutes. Break the vacuum by the addition of methyl chloride.

Moisture:

The quantity of moisture present in a Freon-12 machine which is operating normally is so small that the machine need not be dried out, or a drier used, unless moisture is introduced during the operation of changing to methyl chloride.

Methyl chloride is not as critical to moisture as Freon-12. If a drier is used, do not use calcium chloride.

Changing Control Settings:

A change from Freon-12 to methyl chloride requires resetting the pressure operated controls such as the low pressure control, high pressure cutout, water valves, and expansion valves to approximately the same evaporator temperatures as previously.

Table shows comparative settings based on a 40° design temperature.

How to Reset Controls for Methyl Chloride

Refrigerant	*Low Pressure Control*	*High Pressure Cutout*	*Water Valve*
Freon-12	34# cut-in 14# cut-out	185# cut-out 145# cut-in	90#
Methyl Chloride	26# cut-in 8# cut-out	165# cut-out 125# cut-in	75#

Superheat Adjustment:

Make sure to allow sufficient superheat to assure removal of oil from evaporator.

Float Valves:

Since the density of Freon-12 is much higher than that of methyl chloride, the float balls in the high

Method of Detecting Methyl Chloride in Freon-12

THE following method for determining quickly what refrigerant there is in an installation, and if there has been a mixture of methyl chloride with Freon-12, has been developed by the research department of Kinetic Chemicals, Inc.

The small, inexpensive kits required in making the test can be made up by a laboratory or pharmacy according to the formula:

Solution A (volume 7.4 ml):
1.0 gram (1.1ml) piperidine
5.0 grams (6.3 ml) methyl alcohol, C.P.
0.1 gram (0.1 ml) distilled water in clean 6 dram glass vial rinsed with methyl alcohol, lead lined bakelite screw cap.

Solution B (volume 11.3 ml):
0.1 gram silver nitrate, C.P.
2.0 grams (1.4 ml) nitric acid, C.P., d 1.42
10.0 grams (10.0 ml) distilled water in clean 4 dram glass vial rinsed with distilled water, oil paper lined bakelite screw cap.
Four inch length of clean 7 mm. (or 8 mm.) glass tubing, fire polished at ends, rinsed with methyl alcohol.
Four inch length of clean ¼ inch rubber or synthetic rubber tubing, rinsed with methyl alcohol.

Methyl alcohol, distilled water, silver nitrate, nitric acid, vials and caps, and glass and rubber tubing are carried in stock by most scientific supply houses. Piperidine may be ordered through any scientific company. It is advisable to use fresh piperidine of the best quality obtainable. However, a yellow coloration is not harmful.

It will be convenient to make up some multiple of formula A in a clean glass stoppered bottle and accurately measure 7.4 ml of this solution into each 6 dram vial. Likewise, a multiple of formula B may be made up in a clean glass stoppered bottle and a 11.3 ml portion of this solution added to each 4 dram vial. One kit from each lot should be checked by mixing the two solutions and stirring with the glass tube. The mixture must be perfectly clear.

DIRECTIONS:

Provide a valved outlet and one-quarter inch copper tubing from the vapor phase of the Freon-12 system to be tested.

Open the valve slightly and clear the valve and the short length of copper tubing of liquid refrigerant and oil; then close valve tight.

Connect glass tube to the copper tube with the rubber tubing.

Support the larger vial (solution A) containing the piperidine in an upright position. Insert end of glass tube into the large vial so that the end of the glass tube is one-quarter inch above bottom of the vial.

Carefully open refrigerant vapor valve until three bubbles per second are obtained.

Bubble refrigerant vapor through solution in large vial for fifteen minutes.

Then add contents of smaller vial (solution B) containing silver nitrate slowly and carefully to the larger vial. Any turbidity, milkiness, cloudiness, or opalescence of the liquid means that this sample of Freon-12 contains methyl chloride or some other substance.

Only new or thoroughly cleaned and dried vials should be used, as vials cleaned and wet with chlorine treated water may give false results. Use new solutions for each test.

Vapor valve to control refrigerant vapor bubbles must be opened slowly, and care should be exercised to protect clothing and skin from the solutions. Also, large lens spectacles or goggles should be worn to prevent damage to the eyes. Silver nitrate and nitric acid are corrosive chemicals and may cause injury to the skin, eyes, and clothing.

In offering the idea to the trade, without royalties, Kinetic Chemicals points out that it assumes no responsibility connected with its use.

side or low side float must be larger for methyl chloride than for Freon-12, in order to give equivalent lifting or seating effect. Float must be recalibrated.

Quantities of Refrigerants:

Each pound of Freon charge may be replaced by ⅔ lb. of methyl chloride. It is necessary of course, to check the charge in the usual manner, to be sure you have the proper level of refrigerant in the receiver.

Compressor Speeds:

Substitution of methyl chloride for Freon-12 will not ordinarily reduce the efficiency of a machine designed for Freon. If an increase in displacement is desirable, this can be accomplished by increasing the size of the motor pulley.

Check for Leaks:

Go over the system carefully with a halide torch.

Tag Unit After Changeover:

Units that have been converted to methyl chloride should bear a conspicuous tag indicating this fact.

Types of Units Not Suitable for Changeover

Hermetically-sealed units.

Direct-drive machines.

Systems employing float refrigerant controls.

Systems having a capillary tube refrigerant control.

Systems having any parts such as evaporators, suction or liquid line produced from aluminum.

Large size comfort air-conditioning systems.

List of Equipment . . .

The Wartime Educational Committee of the R.S.E.S., in a pamphlet recently issued, states the case in this manner:

"There are some systems in which methyl chloride *must not* be used—those in which aluminum, magnesium or zinc, or their alloys are used internally in such a manner that the methyl chloride can come in contact with them. These metals are attacked by methyl chloride, resulting in the formation of a highly flammable gas and a black gummy sludge."

Following is an alphabetical list, wherein the manufacturers describe certain of their equipment which has aluminum parts. In a number of cases the manufacturers state that replacement parts are available.

Brunner Mfg. Co., Utica, N.Y.—A limited number of compressors, Models A100FC or FL between the serial Nos. 68000 and 77000, have end buttons in the wrist pins made of aluminum. These are replaceable with buttons made of brass, which may be procured from Brunner Mfg. Co.

Carrier Corp., Syracuse, N.Y.—A now obsolete model of an evaporative condensor made for use with ammonia, was manufactured with aluminum parts. Model Nos. are 15K4-184; 15K4-174; 9P2-224 and 9P3-224.

Certified Products Co., (liquidated) formerly of Toledo, Ohio—Self-contained air conditioning units were equipped with a hermetic unit containing aluminum. Model Nos. C-30-D, C-30-S, C-51, C-31, R-51, C-51-B. No replacements.

Copeland Refrigeration Corp., Sidney, Ohio—The Coplematic unit contains aluminum parts and cannot be charged with methyl. There is no aluminum in any of the open-type Copeland equipment. Watch oil level when changing over the open-type unit.

The Frick Co., Inc., Waynesboro, Pa.—The F-R line of compressors from sizes 8-¾" x 6" to 15" x 10" inclusive,

NIBCO WROT Fittings are formed in one step from straight copper tubing. They are strong, light in weight and dense in structure . . . impervious to gases. Because every fitting is perfectly formed and absolutely "round and square," they are easier to use in production. Laboratory Control and individual plug testing assure close tolerances. You can eliminate service troubles by using vibration-proof and corrosion-proof NIBCO WROT Fittings. Write for complete catalog.

NORTHERN INDIANA BRASS CO.
ELKHART, INDIANA
VALVES AND FITTINGS SINCE 1904

where capacity control is used, has an aluminum gasket between the valve bonnet and cylinder. Aluminum gaskets are replaceable with copper. Early Eclipse compressors had aluminum valve plates which are replaceable with steel. Model Nos. are: 3-cylinder model #FW-325, Serial Nos. 45037 to 45066 inclusive: 45388 to 45417 incl., 44778 to 44782 incl., 44763 to 44777 incl., 44629 to 44643 incl., 44644 to 44648 incl., 4-cylinder model #FW-440, Serial Nos. 45168 to 45197, incl., 44711 to 44725 incl., and 44726 to 44730 incl., 6-cylinder model #FW-650, Serial Nos. 45113 to 45142 incl., 44669 to 44688 incl., and 44649 to 44658 incl.

A few evaporator coils by Frick, made of aluminum, may be identified by inspection.

Gale Products Co., Galesburg, Ill.—Household units have plates stating that they are charged with Freon. These have aluminum in all the evaporators. Their sealed units contain aluminum. Commercial units manufactured by Gale may be changed to methyl.

General Electric Co., Bloomfield, N. J., Air Conditioning and Commercial Division—The sealed-type CT compressors have aluminum parts. These compressors are used in type BT and RT model coolers and model 19-HL-22M2 storage cabinets. Methyl may be used in the open-type CM condensing units and others, if not in violation of the local or national codes.

General Electric Co., Bridgeport, Conn., Appliance and Merchandise Dept.—It is not possible to use methyl chloride in any of their sealed household refrigerating machines.

Gibson Electric Refrigeration Corp., Greenville, Mich.—Household equipment may not in any instance be changed to another refrigerant.

Jewett Refrigerator Co., Inc., Buffalo—All sealed units contain aluminum. This includes the Model 88 domestic refrigerators and Model 4 and 6 low temp. Arctic-Trunk.

Mayflower Products Co., Richmond, Ind.—Some of the compressors had an aluminum oil inspection plug gasket. A new gasket made of copper can be furnished by sending in the compressor model number.

McCray Refrigerator Co., Kendallville, Ind.—The following equipment had a sealed-type condensing unit containing aluminum: Model FO5M double-duty display case; Model GH14FSI, Model FT5M double-duty display case; Model GH14FSI, Model VK6M double-duty veg. displ. case, and Model G413-FSI.

Merchant & Evans Co., Philadelphia—A sealed-type unit contains aluminum. All the open-type units may be charged with methyl.

Nash-Kelvinator Corp., Detroit—Sealed units must not be charged with methyl. Open types may be changed over, but no responsibility is taken regarding equipment to which their unit is connected. Their ice cream cabinets may be changed over.

O'Keefe and Merritt Co., Los Angeles—Sealed units contain aluminum. Year and Model Nos.: 1939 models 639, 739, 4539 and 9639. 1940 models 2540, 4540, 640, 9640, 6640 and 840, 1941 models 2540, 4540, 640, 9640, 6640 and 840.

Sanitary Refrigerator Co., Fond du Lac, Wis, and Continental Corp. (inactive) Request that they be written before making changeover. State name and address of locker user, model no. of locker, serial no. if possible, cabinet serial no. and compressor serial no. Their small lockers were equipped with Chieftain sealed units, not convertible to methyl. Larger conventional units may be converted, but an examination must show no aluminum freezer plates.

Servel, Inc., Evansville, Ind—Sealed Supermetic contains aluminum. Model nos. are: LCC-20F, LDD-25F, MCC-25F, LEE-33F, MDD-33F, MEE-50F. There is no aluminum in any other Servel equipment.

Stewart-Warner Corp., Chicago—Sealed units show the name of the refrigerant on the name plate. All models charged with Freon-12 contain aluminum.

Sunbeam Electric and Mfg. Co., Evansville, Ind.—All units including Coldspot, contain aluminum.

Tecumseh Products Co., Tecumseh, Mich.—All sealed units contain aluminum. Model Nos. are: H18C-1L, H16C-1L, H18S-1L, H15C-1L, H14C-2L, H14C-2H, S88L, S88L5, S889L, S69LS, S64LS, S68L, S64L, S54L, S54H, S48L, S4811L, S34L, S3411L, S38H, S3811H, C24H, C2411H, C54L, C48L, C34L, C68L.

Universal Cooler Corp., Marion, Ohio—All sealed units contain aluminum. Open types do not contain aluminum. Some of their domestic refrigerators, beverage coolers and open-type units employed a capillary tube. Some domestic and beverage coolers had an aluminum low side. A warning tag on these units states that methyl must not be used. Hermetic units containing aluminum have the prefix HC or SHC in their model number.

Westinghouse Electric & Mfg. Co., Springfield, Mass.—All of their units have aluminum parts.

Yates American Machine Co., General Refrigeration Division, Beloit, Wis.—(Lipman) Machines do not contain aluminum parts. Caution: Some ammonia low sides were connected with aluminum tubing.

York Corp., York, Pa., formerly York Ice Machine Co.—Some machinery has aluminum parts as follows: All compressors of a Balanseal type from ⅛ to 15 H.P. had aluminum piston caps on compressors below serial no. 52000. Replace piston with present type. Compressors of the V/W type, sizes 3-¾" x 3", 5-¾" x 4-¼" and 6-¾" x 5" should be checked as many contain aluminum parts. Best method is to send serial no. of compressor to factory. DER-10 FlakIce unit, and cold weld water cooler are not convertible in the field.

Alco Valve Co., St. Louis—Solenoid valve of the type SL made prior to 1939 contains an aluminum seat. Replacement seat is available.

Refrigeration Specialties Co., Chicago—Solenoid valves type S7 1-¼" and 1-½" port size contain aluminum. Types S4, S5, S6 and S8 solenoid valves in all port sizes, do not contain aluminum. Type S7, up to, and including the one-inch port size, do not contain aluminum.

Hints for Change-over to SO_2

There will be instances where it may be desirable to change over to SO_2.

Some say that the general efficiency is not impaired. However, if an increase in efficiency is demanded, a speed-up of the compressor will help. Another way would be to by-pass one of the coolers in a system and gain efficiency in that manner.

Drying: It will be necessary to dry out thoroughly before recharging.

Oil: Recharge with the proper oil for SO_2.

Quantity of Refrigerant: 1 lb. SO_2 for 1 lb. Freon.

Expansion Valve: Change to sulphur expansion valve.

Float Valves: Float valve operation will be satisfactory.

Anti-Freeze Solutions: Beware of anti-freeze materials. Methanol, all preparations containing it, Ice-X, Thawzone, etc. should not be left in a machine if SO_2 is to be added due to the highly corrosive effect of a solution of SO_2 in these various anti-freezes.

Formex Wire: If Formex wire is used in hermetic units, SO_2 cannot be substituted, as sulphur destroys the insulation.

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FRIGIDAIRE TRAINEES LEARN BY SEEING

A new portable "Viso-Trainer," developed to assist in demonstrating the proper methods of servicing Frigidaire refrigeration equipment, is based upon a device used for several years in the company's factory service training. The "Viso-Trainer" is now being used in all of Frigidaire's advanced training schools. Field service men claim it is contributing materially to the service educational program going on at the present time.

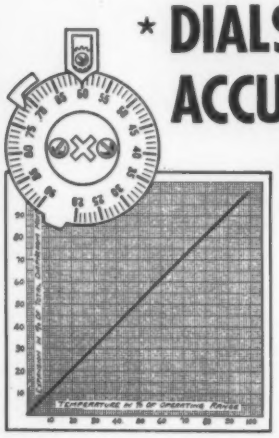
This device consists of a section of transparent bent glass tubing representative of the copper tubing used in an evaporator or cooling unit. The various gauges and thermometers necessary for testing can be installed for the visual class reading. A connection is provided so that many types of household and commercial refrigerant control valves and restrictors can be hooked into the apparatus.

By operating these valves either manually or automatically, actual refrigerant can be passed into the glass tubing, thereby showing students the exact appearance, movement, and results of liquid refrigerant and its conversion into a vapor. Thus, the functioning of various valves and the action of refrigerants are clearly demonstrated as they actually occur in a freezer or cooling unit.

Demonstrating the "Viso-Trainer."

By this means, typical service conditions and problems are duplicated before the students' eyes, and they are shown how such difficulties as oil logging, shortage of refrigerant, excess refrigerant, line restrictions, and so forth, are caused and can be corrected.

★ DIALS are *EVENLY* and ACCURATELY CALIBRATED

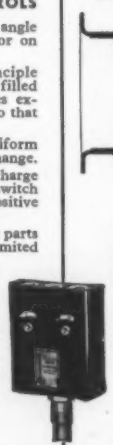


OVER THEIR *ENTIRE* RANGE BECAUSE OF THE STRAIGHT-LINE EXPANSION OF HYDRAULIC-ACTION

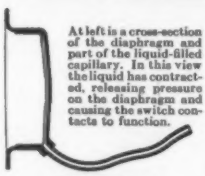
With each degree of temperature, the expansion and contraction of the solid-liquid charge of Hydraulic-Action is exactly the same. That is the reason why the dials on all White-Rodgers Hydraulic-Action controls are *evenly* calibrated—and always are accurate over their *entire* range.

8 EXCLUSIVE FEATURES OF WHITE-RODGERS HYDRAULIC-ACTION TEMPERATURE CONTROLS

1. May be mounted at any angle or position, above, below or on level with control point.
2. Hydraulic-Action principle incorporating solid-liquid filled bulb and capillary provides expansion force comparable to that of a metal bar.
3. Diaphragm motion uniform per degree of temperature change.
4. Power of solid-liquid charge permits unusually sturdy switch construction resulting in positive contact closure.
5. Heavier, longer-wearing parts are possible because of unlimited power.
★6. Dials are evenly and accurately calibrated over their entire range because of straight-line expansion.
7. Controls with remote bulb and capillary are not sensitive to change in room temperature. Accuracy of control is not affected by temperature changes in surrounding area.
8. Not affected by atmospheric pressure. Works accurately at sea level or in the stratosphere without compensation or adjustment.



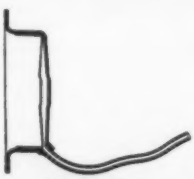
UNIFORM EXPANSION OF HYDRAULIC-ACTION PERMITS TROUBLE-FREE INSTALLATION



At left is a cross-section of the diaphragm and part of the liquid-filled capillary. In this view the liquid has contracted, releasing pressure on the diaphragm and causing the switch contacts to function.

CONTRACTED

No going back to adjust or recalibrate when you equip with White-Rodgers Hydraulic-Action controls. How this works is shown in the illustrations below.



In this cross-sectional view, the liquid charge of the capillary has expanded with a rise in temperature. The positive force of this hydraulic action forces the diaphragm outward and causes the switch contacts to function.

EXPANDED

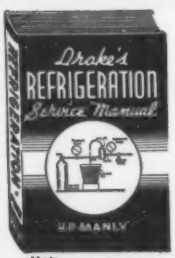
Illustration of the White-Rodgers diaphragm body, the actuating element of every White-Rodgers temperature control. It is so designed as to exert FULL pressure at the point of contact with the switch mechanism.

WHITE-RODGERS ELECTRIC CO.

1225C CASS AVENUE ST. LOUIS 6, MISSOURI

Controls for Refrigeration • Heating • Air-Conditioning

NEW '45 EDITION



REFRIGERATION SERVICE MANUAL

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- Maintenance Men
- Dealers
- Engineers

Only **$2.00** Written by H. P. Manly, refrigeration authority, this NEW book covers refrigeration problems in conversational language so that its 300 pages and 138 diagrams and illustrations can't miss being a real HELP TO YOU. Covers practically every operation in field service and shop operations which may be required. Includes domestic types of refrigeration, and fully and completely explains the commercial types in small and medium sizes, such as used in markets, milk depots, soda fountains, flower shops, etc., as well as in many air conditioning systems.

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The new '45 Refrigeration Service Manual covers repairs and maintenance of gas refrigerators and systems . . . Only $2.00 leaves nothing to doubt . . . explained clearly and concisely. SEND NO MONEY. . . . . .

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Gentlemen:
Please send me the NEW complete '45 edition of Refrigeration Service Manual . . . C.O.D. If book is not entirely satisfactory, I'll return it in 5 days and you will refund my money. I'll pay the postman $2.00 plus few cents postage. SAVE 10% Enclose $2.00 and we'll pay postage, saving you approximately 10%. Same Money Back Guarantee. . . . . .
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. . . . Money enclosed . . . . Send C.O.D.

PROFIT SHARING PLAN ESTABLISHED BY DOLE

Establishment of a profit sharing trust for all employes of Dole Refrigerating Co., Chicago, was announced by President E. J. Tweed at a recent meeting of executives and employes. Seventy per cent of the employes, who had completed one year of service on last Nov. 30, participate the first year.

Any Dole employe in the armed forces at present who enters later is entitled to the same benefits if he returns to the company within six months after his discharge and remains in the company's employ six months thereafter.

Each year, the company will contribute 25 per cent of the net profits to the fund. No contributions are made by employes. Coupled with the trust fund is an ordinary life insurance plan which gives each employe insurance equal to 5 per cent of his basic salary.

UNITED BUYS MIDWEST'S COMMERCIAL INTEREST

Tools, designs, goodwill and production quotas on the Midwest line of commercial refrigerator cabinets have been purchased from Midwest Mfg. Co., Galesburg, Ill., by United Refrigerator Mfg. Co., St. Paul.

United reportedly is planning to start production as soon as possible on a new line of reach-in- units, closely following the Midwest styling and construction. The company has been making beverage coolers, direct-draw beer coolers, and walk-ins.

Midwest is withdrawing from the commercial refrigerator manufacturing field to devote more of its plant capacity to other production.

Here are Al Sherman, Lang-Sherman Co., Frank K. Smith, Tecumseh; and Russell Clark of Bell-Clark Co., Allentown, Pa.

CHECK DOOR GASKETS ON EVERY JOB

JARROW PRODUCTS
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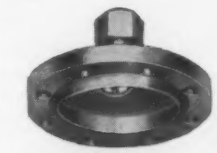


Less Servicing WITH THE DFN SYSTEM!

—AND WHEN YOU DO IT'S FASTER, LESS EXPENSIVE

Freeze-ups, clogging and corrosion have three strikes against them when your installations are equipped with the DFN System. You get unmatched triple protection against moisture, sediment and acid—reducing a major cause of shutdowns!

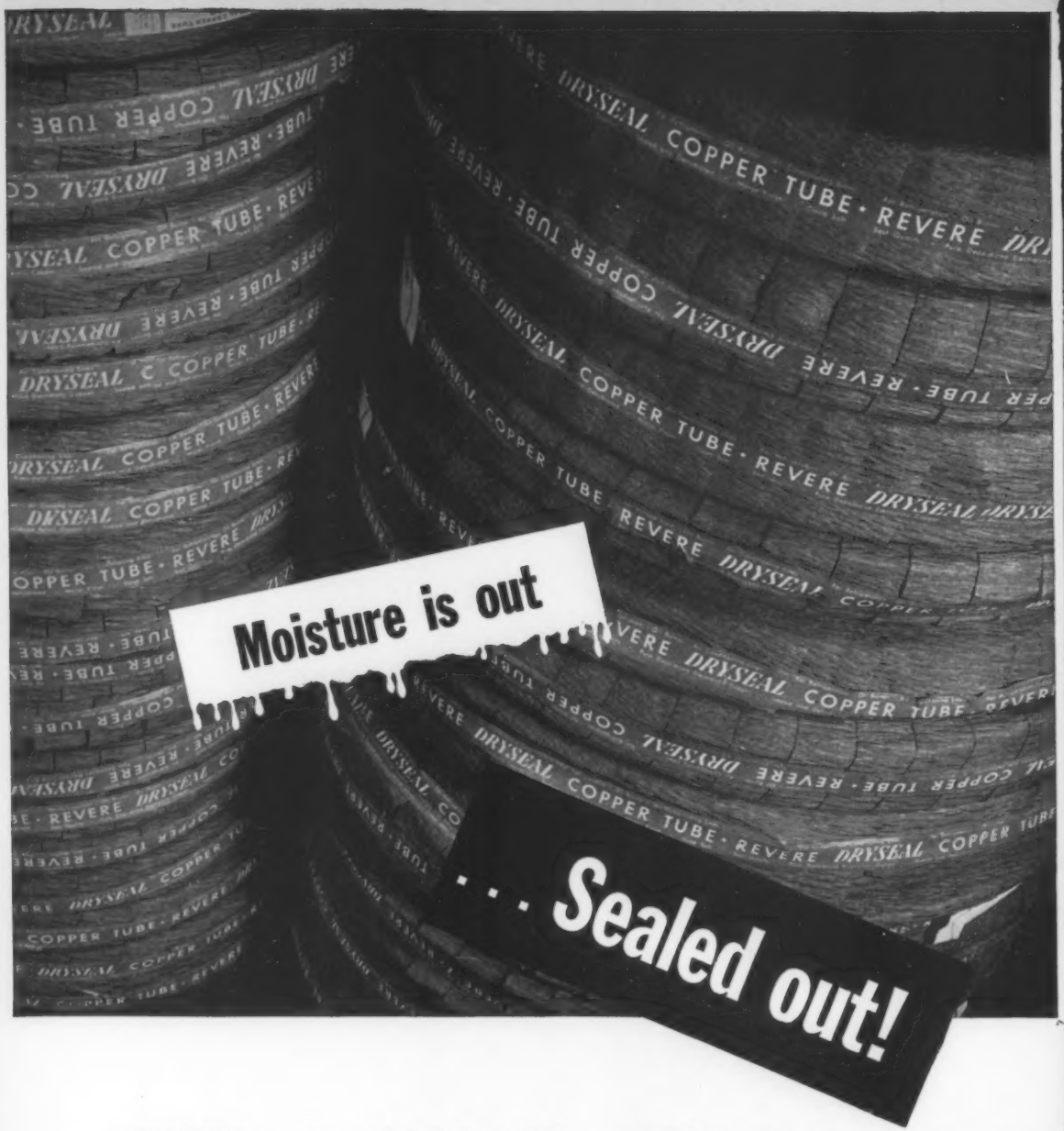
And when the drier is due for a change, you merely open the flange and replace the inexpensive DFN Cartridge. The shell stays on for repeated use. Each cartridge change multiplies your savings in time and parts.

Using the factory-packed, hermetically sealed DFN Cartridge assures the correct quantity and density of dust-free drying and neutralizing agents in each charge. No danger of refrigerant by-passing due to loose packing. Exclusive DFN strainer-filter design filters to minute size, holds more sediment without pressure drop. For full information on how DFN can lick your drying problems, ask your distributor or write us direct.

McINTIRE CONNECTOR CO. NEWARK 5, N. J.

Only the DFN SYSTEM DEHYDRATES FILTERS NEUTRALIZES

DEHYDRATORS • STRAINERS FILTERS • NEUTRALIZERS



AVAILABLE *now*, Revere Dryseal Copper Tube, for refrigeration, air conditioning, heat control, bottled gas and many other uses, is sold by distributors everywhere.

It comes in coils of 25, 50 and 100 feet, and each length is individually treated to remove all interior moisture, then sealed at both ends. You get it clean, bright and bone-dry, so that no moisture is present to react with any refrigerant and produce corrosive products.

This is but one of the "kid glove" treatments given Revere Dryseal Copper Tube so that it will be of utmost usefulness to you. It is made of deoxidized copper and is carefully kept free of oxides through every manufacturing step. In annealing this tube to dead softness, for example, the heating is done in a controlled atmosphere.

It comes in sizes from ⅛" to ¾" o. d. with .035" wall. Also available for refrigeration, air conditioning and a variety of other services is Revere Sealed End Copper Tube. Each end is plugged and taped for protection against injury and contamination. For Revere Dryseal or Sealed End Copper Tube, call your distributor. The Revere Technical Advisory Service is always available to help with your problems.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices: 230 Park Ave., New York 17, N. Y.

BRINGING 'EM BACK . . .
Continued from page 27

A similar letter was mailed to persons on the firm's old mailing list, not regular clients, who were still listed in the city's phone directory.

Hendrix and Jackman are sticklers for keeping up with the mechanical trend of air conditioning and refrigeration, and insist that their men do so, too. All members of the service staff are taking advantage of advanced training offered by the local union, and the officials keep industry magazines at the staff's disposal. Monthly staff meetings are also held, and field problems are thoroughly covered.

"We feel we've weathered the most difficult stage of our comeback—the first six months," says Mr. Jackman. "We've recovered our position—not with spectacular devices, but with reliable standbys in the way of promotions, and with top service."

STANDARD BRASS HOLDS REFRIGERATION CLINIC

Standard Brass and Mfg. Co., Beaumont, Tex., held a "refrigeration clinic" Jan. 20 for friends and customers in the East Texas and Louisiana territory. Approximately 100 refrigeration distributors, dealers and service men attended.

Meeting was under the direction of Burl Boykin, Jr. assisted by Alan L. Cody. Standard Brass hopes to make this an annual affair for refrigeration service men in this area.

Manufacturer's men at the meeting included: George Wilson, Henry Valve; Art Ways, Manufacturers representative; W. H. Knox, Detroit Lubricator; Harry Pearson, Imperial Brass; Jack Baugher, Norman Mundey, Gates Rubber; Jerry Wilkerson, Dole; John Hendrix, Dayton Rubber; W. H. Cody, manufacturers representative; R. P. Waite, Penn Switch; Barney Arbuckle, Virginia Smelting; C. E. Boren, Ranco; Thurston Sevar, Cutler-Hammer; E. W. Montgomery, Lynch.

COREY WILL HEAD NEW DEVELOPMENT FIRM

James J. Corey has resigned as chief engineer of Cordley and Hayes Co. to head a newly established engineering firm, Refrigeration Development Corp., Elmhurst, N. Y.

THE PRACTICAL Refrigeration Engineering MANUAL . . . by Harold Smith

VI. Meat Packing Plants (Cont.)

WHEN a service cooler is used to handle the meat which is ready for distribution to dealers, the major part of the load is the service load. The meat is brought into the service cooler from the aging cooler, and is usually shipped out of the service cooler within a short period of time. Men working in the cooler loading the meat for shipment make up a large part of the load.

Heat leak, of course, is the other big heat load. As tracks are usually installed in the cooler, forced convection evaporators work out nicely for refrigeration purposes; however, fin coils or bare pipe coils may be used.

As the temperatures are similar in all coolers used in a meat packing plant, the low pressure switch on the condensing unit may be used to control the operation of the system and the desired temperatures will be secured, provided careful load figures have been developed for each cooler.

If closer control is desired, a room thermostat can be placed in each room, controlling a solenoid valve which controls the flow of refrigeration to each room as needed to maintain the desired temperature.

In many installations, individual condensing units are used with each cooler. On such installations, each low pressure switch can be set to give the necessary operating conditions in each cooler. The use of individual condensing units is always desirable when price permits, since considerable additional protection is available in case of mechanical breakdowns. Meats can be moved from one cooler to another temporarily until repairs have been made, and this could in some instances prevent a loss of products.

If individual condensing units cannot be used, it is sometimes advisable to put the chill cooler and pickling cooler on one condensing unit and the aging cooler and service cooler on another. This arrangement also protects the job in case of mechanical breakdown, and simplifies the installation to some extent.

Many new packing plants are now being started in all sections of the country, and offer opportunities for the sale and installation of refrigeration equipment. This class of installation is very desirable, and refrigeration sales and service men should keep in touch with prospective operators to get this business.

VII. Frozen Food Processing

PROCESSING of frozen foods is still considered a young industry, and many people in the refrigeration industry have had little or no opportunity to see any of these plants in operation.

The processing of frozen foods was started back around 1927, and in its earlier years was confined almost entirely to the operations controlled by a few large companies who processed frozen food for national distribution.

Several years before the war, the locker storage plant industry began to develop in the midwestern states, and spread both east and west until it now is found in all sections of the country. The locker storage plant marked the beginning of localized frozen food storage and processing plants.

Each year, new plants are being installed in various sections of the country and in the postwar period this industry should become a major activity, and will offer a large market for the sale and installation of refrigeration equipment.

UNITED OPENS BRANCH IN CORPUS CHRISTI

United Refrigeration Co., San Antonio parts jobber, has opened a branch in Corpus Christi at 1318 Agnes St. under management of Vic Skarke. Formal opening was observed recently with a party for refrigeration men, their wives, and manufacturers representatives, at which Jack Friesen was master of ceremonies. Alex Trevino heads the United organization.

CANADIAN SERVICE MEN MEET MARCH 18-19

Sixth annual educational conference of the Interprovincial Association, Refrigeration Service Engineers Society, will be held at the Mount Royal hotel, Montreal, on Sunday and Monday, March 18 and 19.

Program will include technical papers on seals, ice cream service, blower coils, semi-hermetic units, and similar topics related to installation and maintenance problems.

In no phase of the refrigeration industry is the need for continuous, dependable refrigeration performance more essential than in the frozen food industry. Once the food has been processed and frozen, it must be held in a frozen condition until ready for consumption.

Breakdowns of the refrigeration system, causing the product to warm up, are guarded against, as in most cases, once the product starts to thaw out it can not be frozen again, and unless the food can be consumed immediately, results in a serious loss of products. Because of this fact, great care must be used in the designing and engineering of these systems.

STAND-BYS USEFUL

The installation must be made carefully, and every precaution must be taken to protect the equipment against breakdowns or failures. Processors and locker plant operators usually carry liability insurance to protect themselves against such financial losses.

However, the wise operator further protects himself in many instances, when the dangers are pointed out to him, by installing refrigeration equipment consisting of several parallel systems, connected together and controled by hand valves so that any one system can be turned into any part of the installation and provide refrigeration should one of the systems develop mechanical trouble.

An installation of this character involves a larger initial investment than is necessary when the entire refrigeration load is handled with one large condensing unit and a multiple system. The additional expense involved, however, is fully justified, and could save the owner its additional cost by preventing a single loss of frozen products.

A standard processing plant usually employs a cooler operated at a refrigeration temperature of from 35 to 38° F. This cooler is used to chill and hold the products to be processed and frozen, the products being placed in this cooler when they are received at the plant and held there until ready for processing, or until the temperature of the product has been reduced.

If meat is processed in the plant, this cooler would serve as a chill room. When aging is required, as in the freezing of meat, the product is removed from this cooler and placed in a second cooler. The aging process requires several weeks, so this second cooler usually is considerably larger in area than the first, as the product is accumulated day by day and a much larger volume naturally would be held here over the aging period.

EVAPORATOR SELECTION

The second cooler would carry approximately the same temperatures as the first. A variety of evaporators can be used in these coolers. Frequently, forced-draft units are used because the forced circulation of air provides fast heat removal from the product. This feature is particularly desirable in the chill cooler.

Another advantage of the forced-draft unit is its compactness, which permits its use without interfering with track installations, which are frequently used in these coolers. Sometimes finned coils or bare tube coils are used in the aging rooms, depending on the type of refrigerant used and the humidity conditions required in the cooler.

Coils of the bare tube and finned tube construction usually run considerably higher in price, when enough surface is used to operate the coils on a close temperature differential. Also, a great deal more space is required in the cooler if these coils are used, which makes them less popular than forced-draft units.

Proven Pittsberg Products

SULPHUR DIOXIDE

METHYL CHLORIDE

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FREON 22

The Market Place

"I WANT A JOB"
A FREE WANT-AD SERVICE FOR RETURNING FIGHTING MEN

VETERAN who has received honorable discharge from Marine Corps wants a job with some refrigeration servicing organization, preferably in Richmond, Va., area. No pre-war experience but willing and anxious to make place for myself in this field. Box 3451, Refrigeration Industry.

GRADUATE of Commercial Trades Institute, veteran of Army motor transport unit, wants job in refrigeration service field. High-type colored man, 46 years old, single. Willing to work anywhere, but prefer central Illinois area. Box 3452, The Refrigeration Industry.

FRANCHISE WANTED by discharged veteran with 17 years' experience in refrigeration. Interested in merchandising complete commercial line, condensing units, cold plates, coils, etc. Now operating successful partnership, service only. Present building well suited for display, sales. Box 3453, Refrigeration Industry.

HONORABLY DISCHARGED VETERAN of the 68th Troop Carrier Sq. Army Air Forces now engaged in commercial servicing business and employing 2 mechanics, is seeking additional refrigeration repair-installation work or electric motor repair work. Have well-equipped shop. Located in Brooklyn, N. Y. Box 3454, The Refrigeration Industry.

SITUATIONS AVAILABLE

Refrigeration Service Man, Commercial & Domestic. 60% (of $2.50) time paid by customer, 10% commission, all parts & merchandise sold, mileage. Full time. Write Acme Refrigeration Engr., Merced, Calif.

COMBINATION DRAFTSMAN AND GENERAL OFFICE ENGINEER for Refrigeration Air Conditioning Contractors-Distributors. Well financed will expand considerably postwar resulting excellent opportunity right man becoming key employee. Experience both Ammonia Freon applications desired but not required. Application confidential advise qualifications, salary expected RUSHTON EQUIPMENT CO., Box 1751, Birmingham, Alabama.

REFRIGERATION SALES ENGINEER, draft exempt, wanted by well established Midwest refrigeration parts and equipment jobber. Good salary and real future for right man. Write, giving full particulars, Box 3455, THE REFRIGERATION INDUSTRY.

EQUIPMENT WANTED

WANTED: ICE-CREAM CABINET with ice-cream freezer (header), capacity—5 gallons. Dry expansion preferred. Will take header if available, or both. A. Trod, 11 English St., Peabody, Mass.

INSTRUMENTS REPAIRED

Complete overhaul service on pressure, altitude, retard, compound retard, ammonia, freon and hydraulic gauges. Mail direct to Scientific Instrument Service, 3025½ Riverside Drive, Burbank, California.

SPOEHRER-LANGE NOW SPORLAN VALVE CO.

Spoehrer-Lange Co., St. Louis manufacturer of valves and controls, has announced a change of name to Sporlan Valve Co.

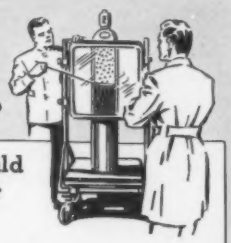
Purpose of the change is to make the company name conform with the trade name "Sporlan", under which the company has manufactured control devices for refrigeration and air conditioning for the past 11 years.

The change in name in no way affects the policies, management, organization or financial structure.

OPENS VANCOUVER BRANCH

Refrigerative Supply, Inc., Seattle, is opening a new branch office at 1871 W. Georgia St., Vancouver, B. C., Canada.

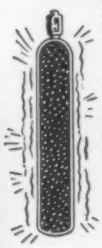
Service Engineers Should Know...



Why: Refrigerant cylinders should never be filled beyond their specific rated capacity.

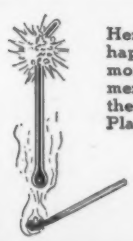
1. Cylinders of the same water capacity have a different maximum filling capacity for each refrigerant. For instance, a cylinder with a maximum capacity of 5 lb. of SO_2 must not contain more than 3½ lb. of Methyl Chloride. X-Rayed, a properly filled cylinder looks something like this:

2. The liquid must not completely fill the container when heated to 130° F. The liquid refrigerant will expand about 11% in volume during a temperature rise from 40° to 130° F.



3. If too much refrigerant is put into the cylinder, the liquid expanding under heat may fill the cylinder completely, causing powerful and dangerous hydrostatic pressures.

4. This is what happens when the hydrostatic pressure can no longer be contained — the cylinder explodes violently. Never overfill cylinders; it is dangerous!



Here is a simple illustration of what happens from overfilling. A thermometer works perfectly until the mercury, expanding from heat, hits the top of the tube. And then, pouf! Play safe — don't overfill cylinders!

Manufacturers of
"Virginia" Refrigerants and Agents for Kinetic's "Freon-12" — "Freon-22" — "Freon-11"

VIRGINIA Smelting Co.

WEST NORFOLK, VIRGINIA

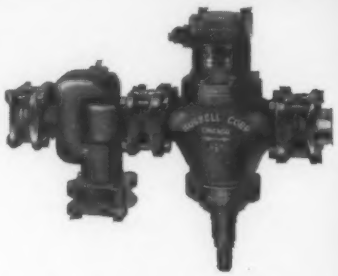
76 BEAVER ST., NEW YORK 5 :-: 131 STATE ST., BOSTON 4

Suction Line Stop Valves

A new line of suction line stop valves, designed to overcome the deficiencies of conventional electric solenoid valves under severe moisture conditions, has been developed by Hubbell Corp., Chicago.

Of patented construction, the new valve is of the power piston type, using the high pressures to force the valve open. A small feeler line is run from the liquid line to the power piston cylinder. When the liquid stop valve is open, the high pressure forces the power piston to open the main suction port.

Lower face of the power piston is provided with a seat disc which seals off on a seat bead, preventing high side pressure from passing down the wall of the power piston and into the suction line. A heavy closing spring



is used under the main disc piston, to assure powerful movement for either opening or closing the valve.

The valves are all provided with auxiliary stems by means of which they may be opened manually. This feature is said to make unnecessary the construction of the usual hand by-pass around the regulator to permit the pumping out of the evaporator. The valves are available in any size from 1 inch to and including 8 inches, for all refrigerants.

Metal Cleaner

Pennsalt Cleaner EC-10 is a new organic type cleaner produced by Pennsylvania Salt Mfg. Co. This metal cleaner employs a new principal, as a result of which it removes soil which alkaline cleaners hardly touch in the short time usually allotted for cleaning. It is especially adapted for the quick removal of drawing compounds or cutting oils in a single operation. The company has just issued a folder explaining the use of the cleaner in both the dip cleaning and spray washing methods of cleaning.

Industrial Timer

A new manually preset interval timer, having exceptionally wide application has been announced by Paragon Electric Co., Chicago.

The new model can be preset to allow a given operation to continue for almost any pre-determined time limit; and to close or open a circuit at the end of the preset time.

Features are: (1) Switch—single

He carries your answer—

Ask for Renewal Parts Handbook #110

Yes! our Renewal Parts Handbook *does* provide the answers to your parts problems.

This big 136 page book of exact and detailed illustrations of thousands of parts complete with a net price supplement indicating your exact cost on each item will be indispensible in your purchasing department and repair shop.

Your *Free* copy is yours for the asking. Be sure to write today!

Not GE Inc. Parts for Motors, Fans and Controllers

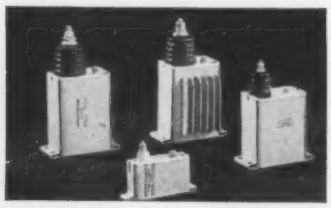
complete-reading electric co.

100 So. Jefferson St., Chicago 6, Illinois

pole, double throw 1,000 watt capacity, fully enclosed. Underwriters approved. (2) Only two exposed gears —motor pinion and wheel, precision hobbed. (3) Motor—self starting, slow speed, industrial type synchronous, completely sealed. (4) No energy is required of clock motor to trip switch at end of preset time. (5) Ten time ranges from 0 to 15 seconds through 0 to 20 hours. Available in all types of enclosures. (6) All parts rust proofed and protected against corrosion.

Paper-Dielectric Capacitors

A new line of high-frequency paper-dielectric capacitors, available in ratings of 5000 to 20,000 volts d-c, 0.01 microfarad, has been announced by General Electric Co. Developed primarily for grid- and plate-blocking service in the electronic-oscillator circuits of high-frequency induction-heating equipments, they can also be



used in other high-frequency oscillator circuits of a similar nature.

The internal kraft-paper and aluminum-foil assemblies, compactly arranged and impregnated with a low-loss liquid dielectric, are hermetically sealed in rectangular metallic cases.

Units are supplied with removable footed-type brackets, which provide for a firm four-point mounting in any position.

Level Control

A level control utilizing electronic principles has been developed by Trimount Instruments Co., Chicago. It is claimed that this new control will maintain, or keep within desired limits, the level of any liquid or electrically conducting solid within an open or closed tank, bin, hopper, or other container.

It indicates the level by signals, or can be installed to operate solenoid or motor-driven valves, pumps, lights, bells, or other electrical devices.

The control is non-mechanical and has no moving parts. It also has no chemical or other effect on liquids or solids being controlled, it is claimed.

Use
"CLEAN-A-COIL"
for
de-scaling
cleaning

Water cooled
condensers
cooling coils
evaporators

NOT CLASSIFIED AS
CORROSIVE LIQUID

Write for descriptive
literature or
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Standard Solvent Co.
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VISOLEAK FINDS 'EM

RED SPOT FURNISHES CLUE TO REFRIGERANT LEAK DETECTION

VISOLEAK is a finely-treated colored refrigerant oil which penetrates every nook and cranny of the system. The leak is indicated by a red stain – similar to the discoloration on a carburetor in which ethyl gasoline has been used. Can be used *safely* and *effectively* with any type of refrigerant. See your jobber today. If he has not stocked Visoleak write for complete information.

WHOLESALE PRICES		CASE LOTS
4 ounce bottle	$ 1.00	48 bottles
8 ounce bottle	1.75	24 bottles
1 pint bottle	3.00	24 bottles
1 quart bottle	5.00	12 bottles
1 gallon can	16.00	6 cans

SAVE 10% ON CASE LOTS

WESTERN THERMAL EQUIPMENT CO.
5141 ANGELES VISTA BLVD.
LOS ANGELES 43, CALIF.

G. I. or General—It's all the Same to Army's 'Mr. Fixit'

WHEN I was called upon to repair Lt. General Mark Clark's icebox in Italy, I considered it merely a part of my routine job."

So says Sgt. George L. Fox, who served as a Quartermaster refrigeration mechanic in the Mediterranean war area for more than a year. While

there he and his fellow mechanics repaired all types of refrigeration equipment from portable warehouses to giant 10-ton refrigeration trailers.

Sgt. Fox, now back as an instructor at the Quartermaster Refrigeration School of Camp Lee's Army Service Forces Training Center, was a member of the first QM refrigeration unit to be organized by the U.S. Army. The unit was set up at Camp Shelby, Miss., and trained there, prior to coming to Camp Lee in October, 1941 for further instruction.

The unit consisted of four officers and 103 enlisted men, together with necessary equipment, including 30 mobile refrigeration trailers. Some of the trailers were maintained at a temperature of 35° F. for the preservation of vegetables, while others were kept at 20° for storing frozen items. Still others were used as storage warehouses for anti-toxins used by the Medical Corps.

The outfit arrived in North Africa at Oran in January 1943. While in Africa it operated in four sections—at Casablanca, Constantine, Oran, and Mateur. Work was constant, distributing perishables to various elements of the Seventh Army throughout the country.

In the Italian campaign, one platoon landed in September 1943 and the other three arrived in the following February. One unit set up in Naples, while others followed the Allied forces as they advanced up the peninsula.

Sgt. Fox stayed with the unit located at Naples, where he did maintenance work on the mobile and fixed refrigeration equipment that was brought in. He reports that there was considerable trouble caused by lines breaking on the trailer vans, with a resulting loss of Freon.

The lines would break usually at the point where they were connected with the cold plate. The mechanics solved the trouble by soldering the connections.

Of the operations of the mobile units that carried perishables to the front, Sgt. Fox says that on occasion they would get as close as two miles from the battle lines. One time in North Africa, food was being hauled to a ration dump near the front. Enemy strafing planes came over resulting in loss of a tractor-trailer.

The driver and assistant leaped from the cab of the tractor which went over an embankment. Things got so hot at the dump that two days later it had to be moved further to the rear.

Sgt. Fox's home is at 111 Huntington Place, Cincinnati. In civilian life he was a refrigeration mechanic in Clermont County, Ohio.

ACTION APLENTY ON "ROAD TO TOKYO"

There's action aplenty along the "Road to Tokyo" as Universal Cooler Corp. steps up production, for the Quartermaster Corps, of a special series of two temperature refrigerating units (10° F. for frozen foods and 35° F. for perishable foods) that incorporate new design and performance features.

Produced on the 350 foot automotive type assembly line that workers named "Road to Tokyo" when it first was built to produce special two-temperature units for the Army, the new units are for installation in portable refrigerators. These boxes are for the storage and transportation of frozen or perishable foods in Army trucks and freight cars, aboard ships, and at beachhead supply points.

A pilot model, designed and built by Universal Cooler research engineers, underwent rigid approval tests at Camp Lee, Va. Small, compact and gasoline powered, these units are designed to refrigerate 125 cu. ft. boxes. All units are shipped to prime contractors for mounting in the portable cabinets.

Prime contractors include the Amana Society, Amana, Iowa; Quillen Brothers Refrigerator Co., Indianapolis; Federal Store Equipment Co., Milwaukee; U. S. Thermol Control, Minneapolis; United Refrigerator Co., Hudson, Wisc., and Harold L. Schaefer, Inc., Minneapolis.

NEW FAST FREEZER FOR FOOD PLANTS

A new fast freezer which delivers 6,000 pounds of fresh produce an hour is now at work in the food processing plant of John S. Isaacs & Sons, Ellendale, Del., and will be used to quick freeze annually more than a million and a half pounds of lima beans alone in this center of U. S. lima bean growing.

The fast freezer, developed as part of a new line of such equipment for producers by York Corp., is installed in a four story food storage plant.

In addition to handling other truck produce from the Isaacs farms, the freezer will handle a large portion of the poultry raised on the Isaacs land and sold to independent packers. An average of 300,000 chickens are kept by the Isaacs company for the produce market.

When completed, the cold storage plant in which the freezer operates will hold 200 carloads of frozen food and most of this space will ultimately be used to store frozen products before they are released to the market. Refrigerated rooms already completed are now used to hold approximately 50 carloads of frozen produce for the Army.

Until war needs are satisfied, new rooms will be turned over to army storage as they are completed. Combined, the present fast freezer and compressors supplying the storage rooms have a refrigeration capacity of 110 tons. The rooms, 12 of them in all, are kept at temperatures ranging from –20° F. to 10° above zero.

. . . Previously, firms not on List A could get Freon only under certain specified operating conditions.

Manpower still is the key to reconversion to civilian production . . . It now appears that cutbacks after V-E Day will be closer to 20 per cent than to 40, as was originally thought . . . Spot authorization procedure is still being tightened, especially on stainless steel.

WPB's Requirements Committee has decided that refrigeration and air conditioning equipment will be classed as a List II (non-military) item, for purposes of limiting production of civilian orders to fourth quarter 1944 levels . . . Any requests for increased production will therefore have to be accompanied by a definite showing justifying the increase.

Proper care of refrigerators and other mechanical appliances is urged by OCR in a message to householders . . . Shortage of repairmen may mean months of delay in having repairs made, OCR warns . . . Particular care is advised as to small motors, which require highly technical repair service and are apt to be slower than normal.

Thos J. Boyer, Chicago, a general building contractor charged with illegal diversion of 31 new refrigerators from defense housing projects, faces a three-month loss of materials, allocations, and priorities assistance . . . Twenty-six of 47 Philadelphia service firms charged by OPA with failure to keep price records and post maximum price lists for repair charges have agreed to an injunction requiring that these regulations be observed.

A WPB consent order has been issued against the Downtown Store Fixture Co., Cleveland, for improperly applying ratings for materials and equipment worth $7,395, and accepting delivery of 7 walk-ins and 18 condensing units without furnishing an approved order.

● BRIEFLY TOLD

ANSWERING THE QUESTION, "Is year 'round air conditioning practical for low-cost homes?" at the recent meeting of the National Association of Home Builders, P. B. Zimmerman (Airtemp) declared that "it seems quite likely that cooling equipment can be provided in the postwar period to take adequate care of the average small home at a cost no greater than $3 a month on a FHA contract . . . not more than $50 for the summer season."

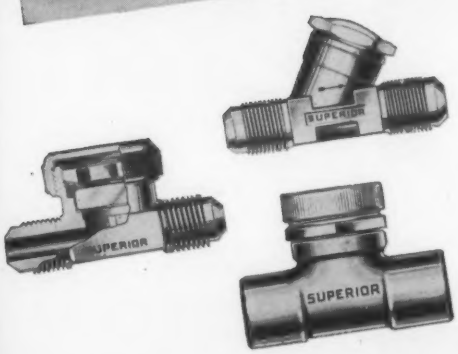
Westinghouse has applications before FCC for television transmitters in Pittsburgh, Philadelphia and Boston.

United Refrigerator Mfg. Co., of St. Paul, Minn., and Hudson, Wis., has acquired the cabinet business of Midwest Mfg. Co., Galesburg, Ill., and Pittsburgh Store Fixture & Equipment Co., Blairsville, Pa. Both lines are scheduled for postwar marketing under the "United" trade-mark. Manufacturing will be done at Connellsville, Pa. on both lines.

A dealer-servicemen's organization has been started in New Orleans, with 33 members, more than 80 per cent of eligibles, as a nucleus. Only dealers who have a servicing operation may join. John Ackermann of ABC Refrigeration is president, George Mims is vice president, Earl Wolfe, secretary, and V. G. McPherson, treasurer.

Superior

"Non-Chattering" CHECK VALVES AND LIQUID INDICATORS

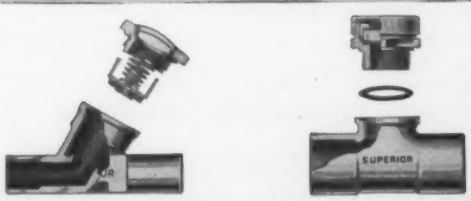


No. 112

SUPERIOR CHECK VALVES—unique design, positive acting, spring-operated—cannot chatter, hum or buzz under any normal operating conditions. Pressure drop is negligible. Install one in the suction line of each low temperature circuit of all low temperature jobs—your assurance of maximum performance and trouble-free operation.

SUPERIOR LIQUID INDICATORS—call them liquid indicators, sight glasses, or refrigerant shortage detectors—one should be installed in the liquid line of each system. Seal cap over sight glass is double assurance against damage and leaks.

Note these exclusive features



The novel design of these SUPERIOR Check Valves permits the easy removal of all internal parts—**as a unit**—while soldering lines to valve connections, or for subsequent inspection.

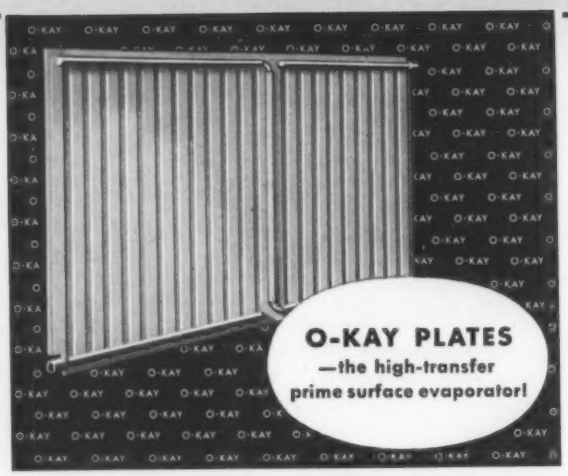
Entire upper assembly of SUPERIOR Liquid Indicators—in all sweat sizes—may be removed **as a unit** to preclude damage by heat while soldering lines to body connections.

If you haven't a copy of Catalog R2, request one today

SUPERIOR VALVE & FITTINGS COMPANY

PITTSBURGH 26, PENNSYLVANIA

OFFICES IN PRINCIPAL CITIES • WEST COAST STOCK, LOS ANGELES (15) • JOBBERS EVERYWHERE



Investigate O-Kay plates — the finest cooling devices available to the refrigerator industry. Ideal for freezer cabinets, storage rooms, salad pans, milk coolers — all low temperature applications. Write Kay, today!

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KAY PRODUCTS COMPANY, Division of Tyler Fixture Corp. **NILES, MICH.**

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ICE-X quickly cures emergency freeze ups when ice forms at the expansion valve or capillary tube. Harmless to use. Great for Freon, Carrene, or Methyl Chloride systems . . . The dependable liquid anti-freeze.

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JOBBERS: WRITE FOR SPECIAL PROPOSITION!

VOLUMETRIC EFFICIENCY . . .

Continued from page 30

9. Poor fan or improperly directed fan.

10. Scale in water tube of water-cooled condenser.

11. Restricted water tube in water-cooled condenser.

12. Water valve not set or working properly in water-cooled condenser installation.

13. Too much refrigerant in condenser, resulting from too much in system or parts of liquid line and distribution points partially plugged.

(c) Too much clearance volume resulting from

1. Improper initial design in compressor.

2. Wear in main bearing, connecting rods, or wristpins.

3. Gaskets under valve plate too thick.

4. Damaged head plate or piston.

(d) Leaky suction or discharge check valves or leaks by piston resulting from scored cylinder, loose piston, stuck rings, insufficient oil, etc.

(e) Overcooling during compression to the extent of getting some condensation in the cylinder.

UNIVERSAL COOLER FIELD MEN MEET

War production and postwar potential of Universal Cooler Corp. were outlined at the annual executive conference held at Hotel Harding, in Marion, Ohio. Problems attendant upon reconversion and production for peace, as well as new advertising, sales and servicing plans, came up for discussion at the two day meeting.

In attendance were all of Universal Cooler's field engineers in this country, and General Manager Dan Robertson and Sales Manager Harry Parrish, of Universal Cooler of Canada, Ltd. UCC Vice President Tom Pendergast presided.

"TAG" ASSETS ACQUIRED BY PORTABLE PRODUCTS

The C. J. Tagliabue Mfg. Co., pioneer manufacturer of industrial control and laboratory instruments has sold its assets, including goodwill, name and patents, to the Portable Products Corp., Pittsburgh.

Dependability doesn't happen...

IT'S ***BUILT INTO*** EVERY AP VALVE

MODEL 206
(FIXED SUPERHEAT) THERMOSTATIC
EXPANSION VALVE

Ideal...

FOR SMALL UNIT REFRIGERATION MANUFACTURERS

● For close coil regulation and steady, dependable performance, use this "A-P" Model 206 Thermostatic Expansion Valve. Factory-set at your desired superheat setting, no field adjustments are required, and the valve remains tamper-proof. Built under rigid factory inspection — with all parts microscopically examined and thoroughly tested during and after fabrication. Install Model 206 with full confidence in any application where the superheat setting has been predetermined.

Wherever a non-adjustable expansion valve is required, or preferred, the A-P Model 206 is best. Absolutely reliable and dependable, it maintains a constant superheat over a wide range of evaporator temperatures — a real advantage in this type of valve. Its maximum capacity — 0.61 tons Freon; 1.32 tons Methyl or Sulphur.

NOTE THESE FEATURES...

- ★ Liquid cross-charged for maximum efficiency
- ★ Three orifice sizes
- ★ Built-in Strainer 1.23 sq. in.
- ★ Small size for hard-to-get-at applications
- ★ Factory-set superheat 10; 5 to 15 degree available range
- ★ Free acting diaphragm

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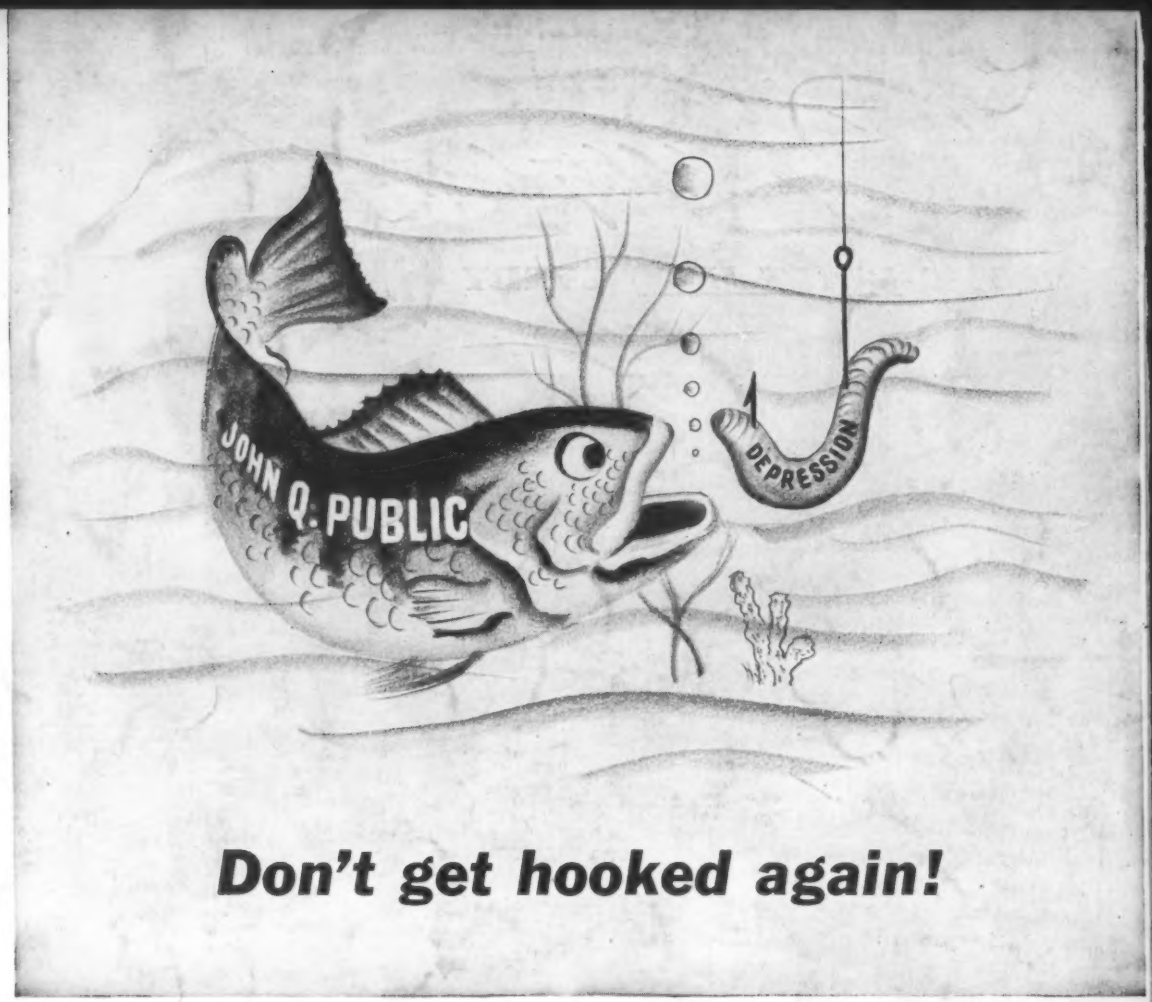
DEPENDABLE
REFRIGERANT VALVES

Stocked and Sold by Progressive Refrigeration Jobbers Everywhere — Recommended and Installed by Leading Refrigeration Service Engineers.



Don't get hooked again!

Only yesterday (YOU remember!) men sold apples on the streets, saw their furniture go back to the store, lost their houses, lost their farms. Will it happen again? It needn't.

But to avoid the kind of depression we had after the last war—WE MUST HEAD OFF INFLATION NOW! And the best way to do that is to save your money.

When you don't buy a thing you can get along without . . . *that's helping to prevent inflation*. When you decide this is a bad time to ask more money for the things you sell or to fight for a raise . . . *that's helping to prevent inflation*. When you pay up all your debts . . . *that's helping prevent inflation*. AND SOMETHING MORE!

It's the best way to protect yourself against a depression if one should occur, *and* the best way to prepare yourself for tomorrow's opportunities if times are good.

The smart thing today is to save, not splurge. Don't get hooked again!

4 THINGS TO DO to keep prices down and help avoid another depression

1. Buy only what you really need.
2. When you buy, pay no more than ceiling prices. Pay your ration points in full.
3. Keep your *own* prices down. Don't take advantage of war conditions to ask more for your labor, your services, or the goods you sell.
4. *Save*. Buy and hold all the War Bonds you can afford—to help pay for the war and insure your future. Keep up your insurance.

HELP US KEEP PRICES DOWN

A United States War message prepared by the War Advertising Council, approved by the Office of War Information, and contributed by this magazine in cooperation with the Magazine Publishers of America.

THE REFRIGERATION INDUSTRY